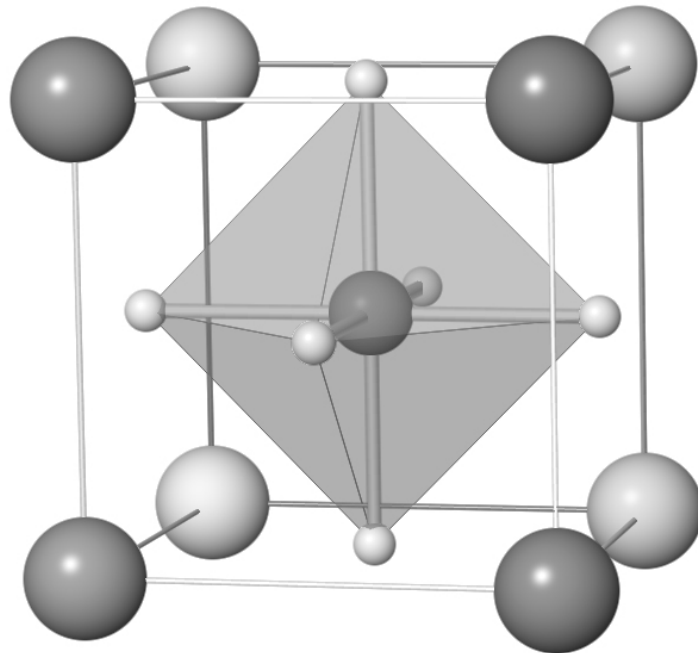


Steffen Weber's

# Crystallography Picture Book

## *Crystal Structures*



# *Preface*

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This is volume five in the series of picture books that I am creating for educational purposes. All images in this volume were created using the program *JPOWD from MDI* ([www.materialsdata.com](http://www.materialsdata.com)). The structures presented here correspond to the crystal structure gallery on my website ([www.jcrystal.com/steffenweber/gallery/StructureTypes/st1.html](http://www.jcrystal.com/steffenweber/gallery/StructureTypes/st1.html)). On that website you can also find further data, such as unit cell parameters and atom coordinates .

I recommend using Acrobat Reader 6.0 or higher, because these newer versions feature image smoothing.

*Steffen Weber, Ph.D.*  
*December 15, 2004*  
*Livermore, California*  
[www.jcrystal.com/steffenweber](http://www.jcrystal.com/steffenweber)

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# Contents

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## Elements

W - type (bcc)	C - Diamond	As (grey)	$\alpha$ -Po
Cu - type (fcc)	C - Graphite	$\alpha$ -S <sub>8</sub>	I <sub>2</sub>
Mg - type (hcp)	P (white)	Se (grey)	

## AB

NaCl	ZnS - Sphalerite	NiAs	PbO (red)
CsCl	ZnS - Wurtzite	$\alpha$ - BN	PtS

## AB<sub>2</sub>

CaF <sub>2</sub>	CdI <sub>2</sub>	SiO <sub>2</sub> - Tridymite	Cu <sub>2</sub> O
TiO <sub>2</sub> - Rutile	SiO <sub>2</sub> - Quartz	MgCu <sub>2</sub>	MoS <sub>2</sub>
CdCl <sub>2</sub>	SiO <sub>2</sub> - Cristobalite	AlB <sub>2</sub>	FeS <sub>2</sub> - Pyrite

## AB<sub>3</sub>

ReO <sub>3</sub>	MoCl <sub>3</sub>	ZrI <sub>3</sub>	VF <sub>3</sub>
CrCl <sub>3</sub>	Cu <sub>3</sub> Au		

## A<sub>2</sub>B<sub>3</sub>

Al<sub>2</sub>O<sub>3</sub> - corundum

## A<sub>3</sub>B<sub>4</sub>

MgAl<sub>2</sub>O<sub>4</sub> - spinel

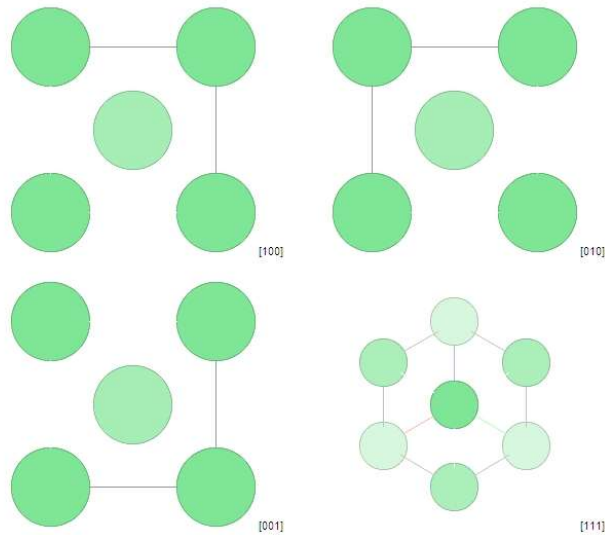
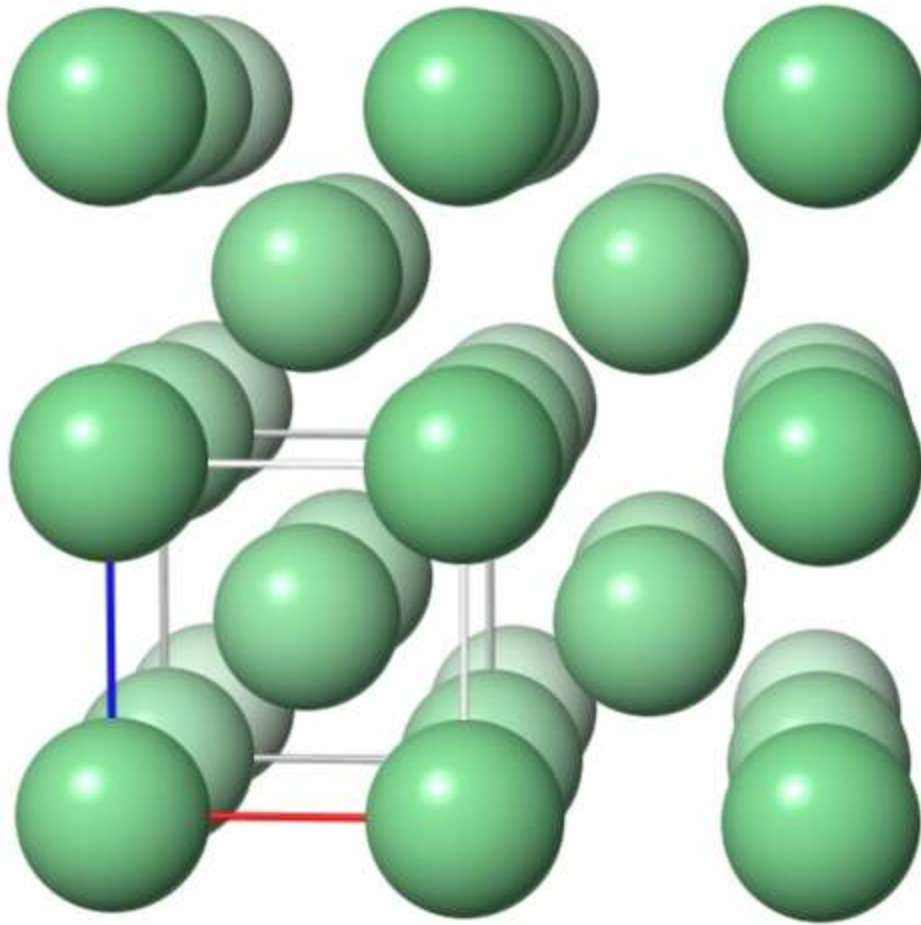
## Others

Olivine	TiOBr	Ilmenite	Aragonite
Granate	Perovskite	Calcite	

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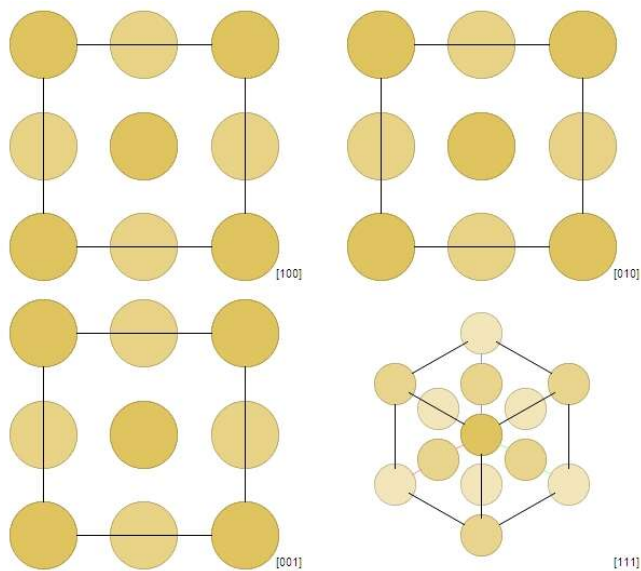
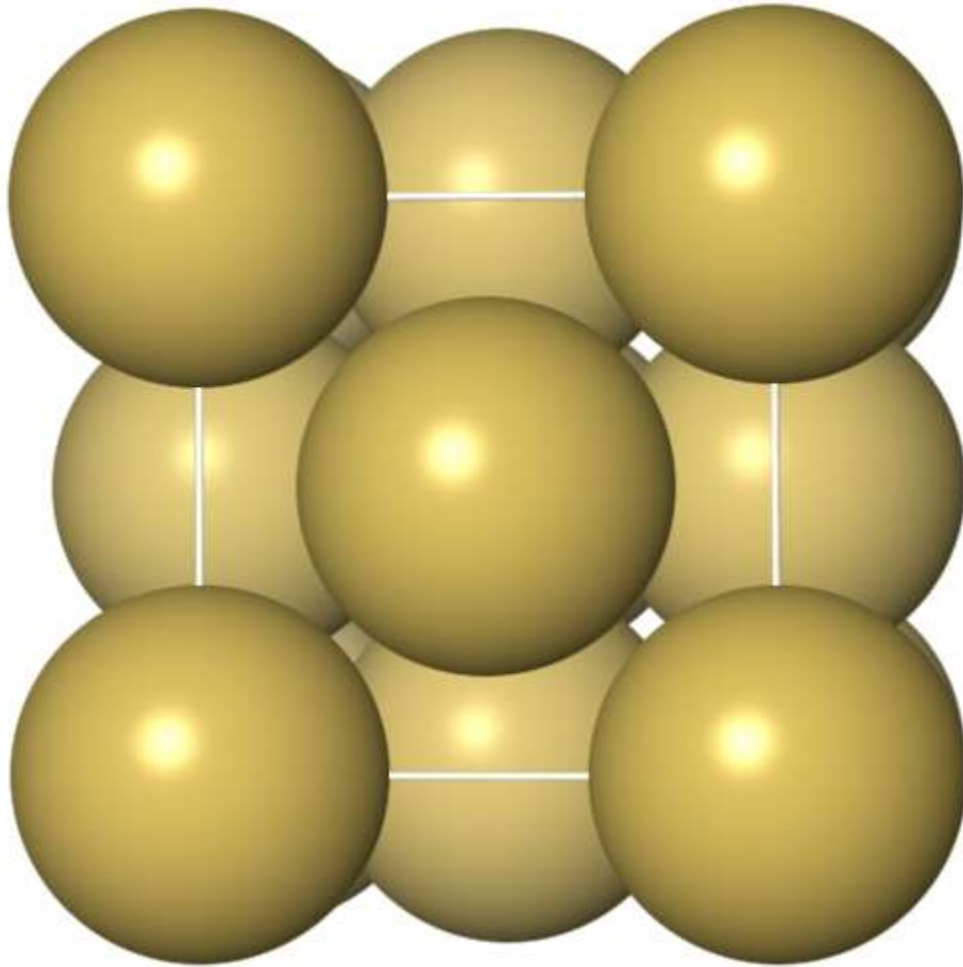
# $W$ (Elements, Tungsten)

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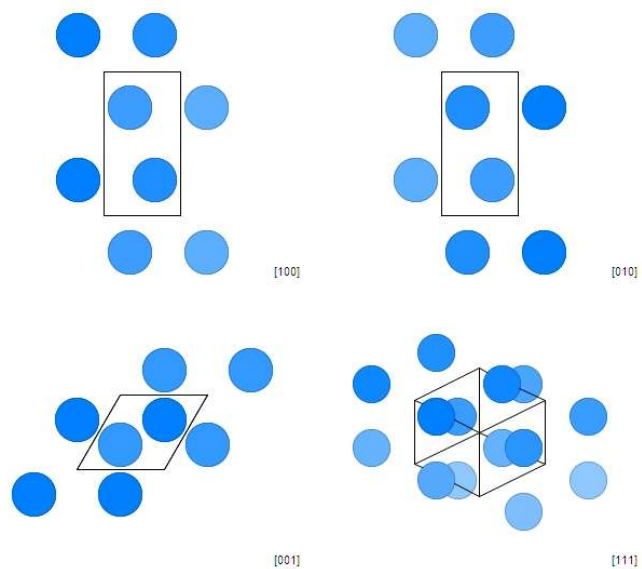
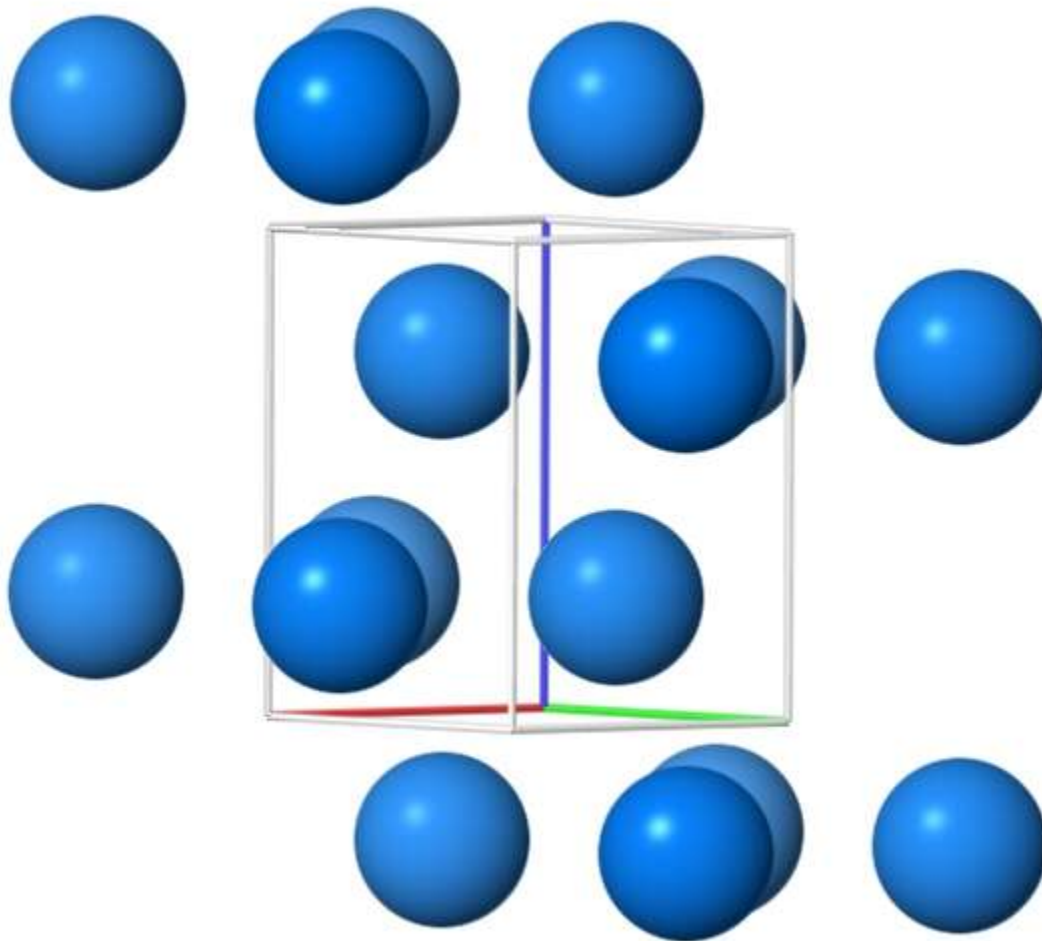
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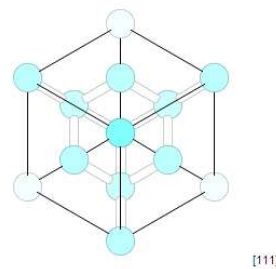
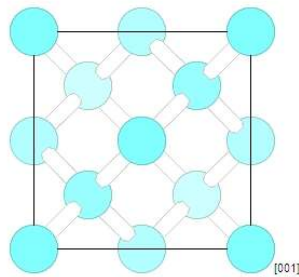
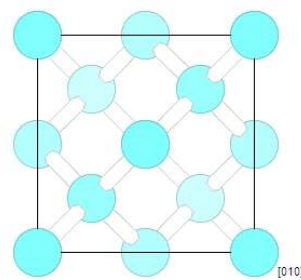
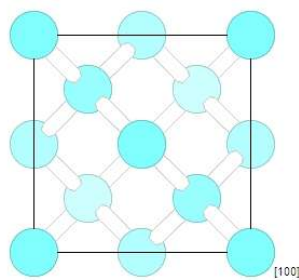
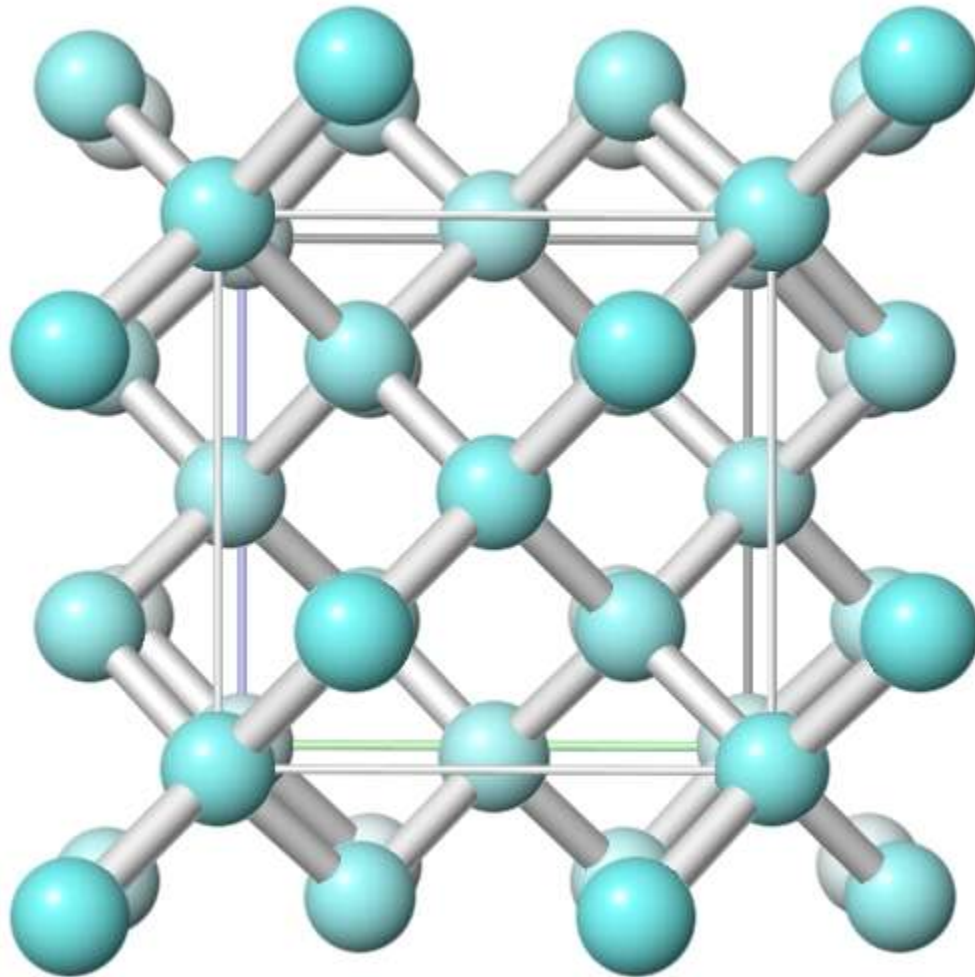
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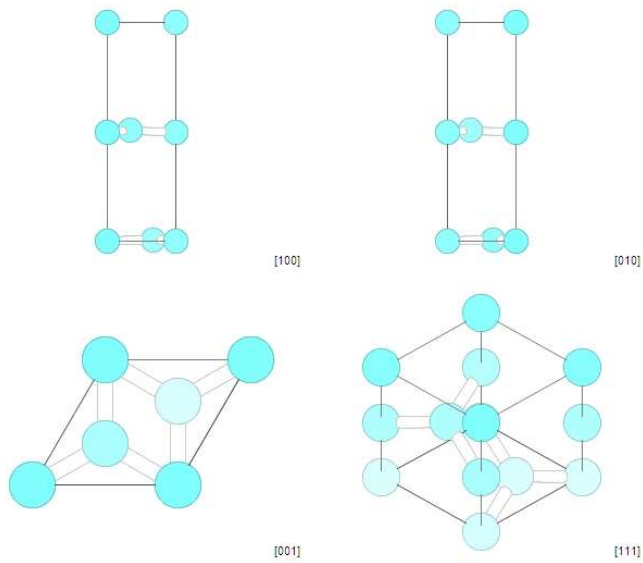
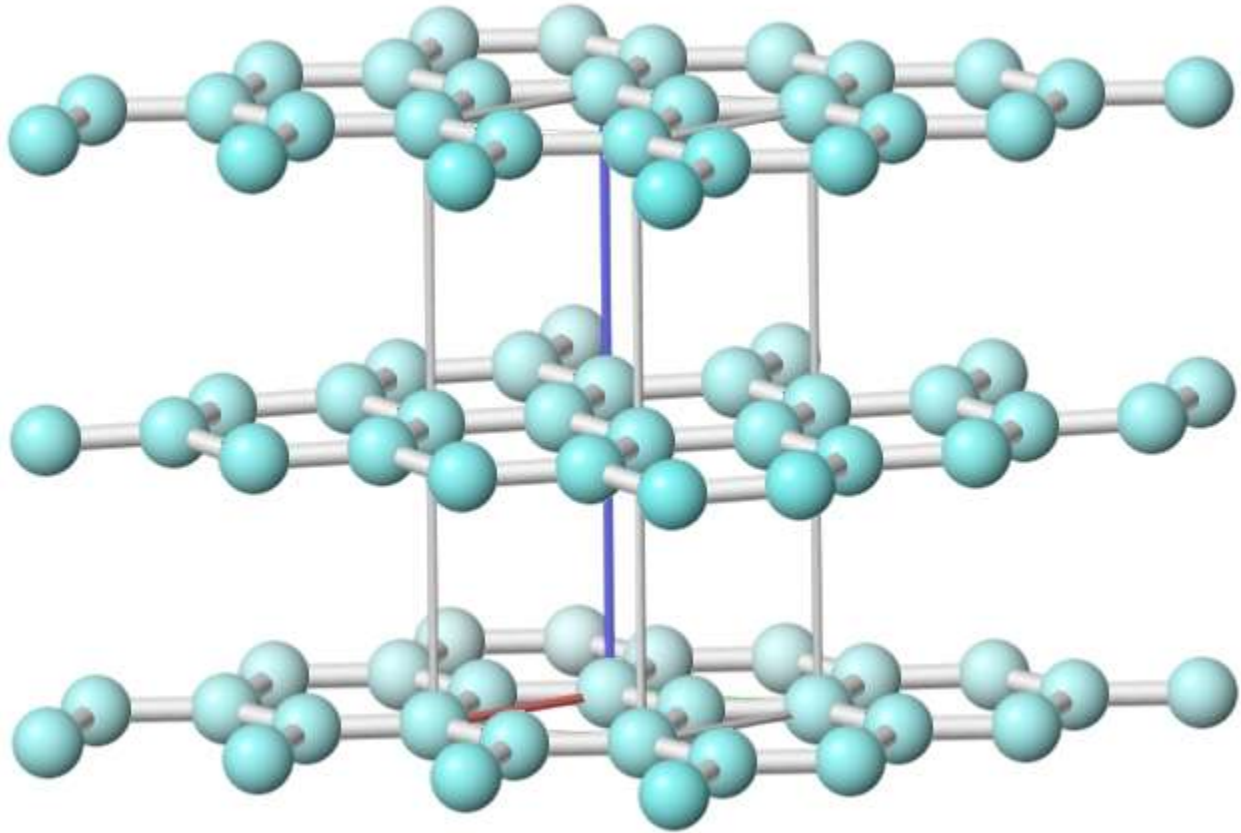
# C (Elements, Diamond)

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# C (Elements, Graphite)

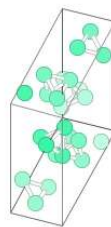
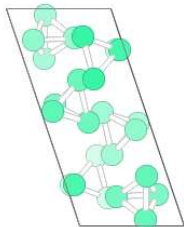
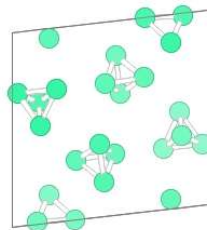
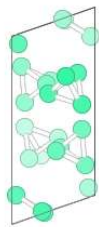
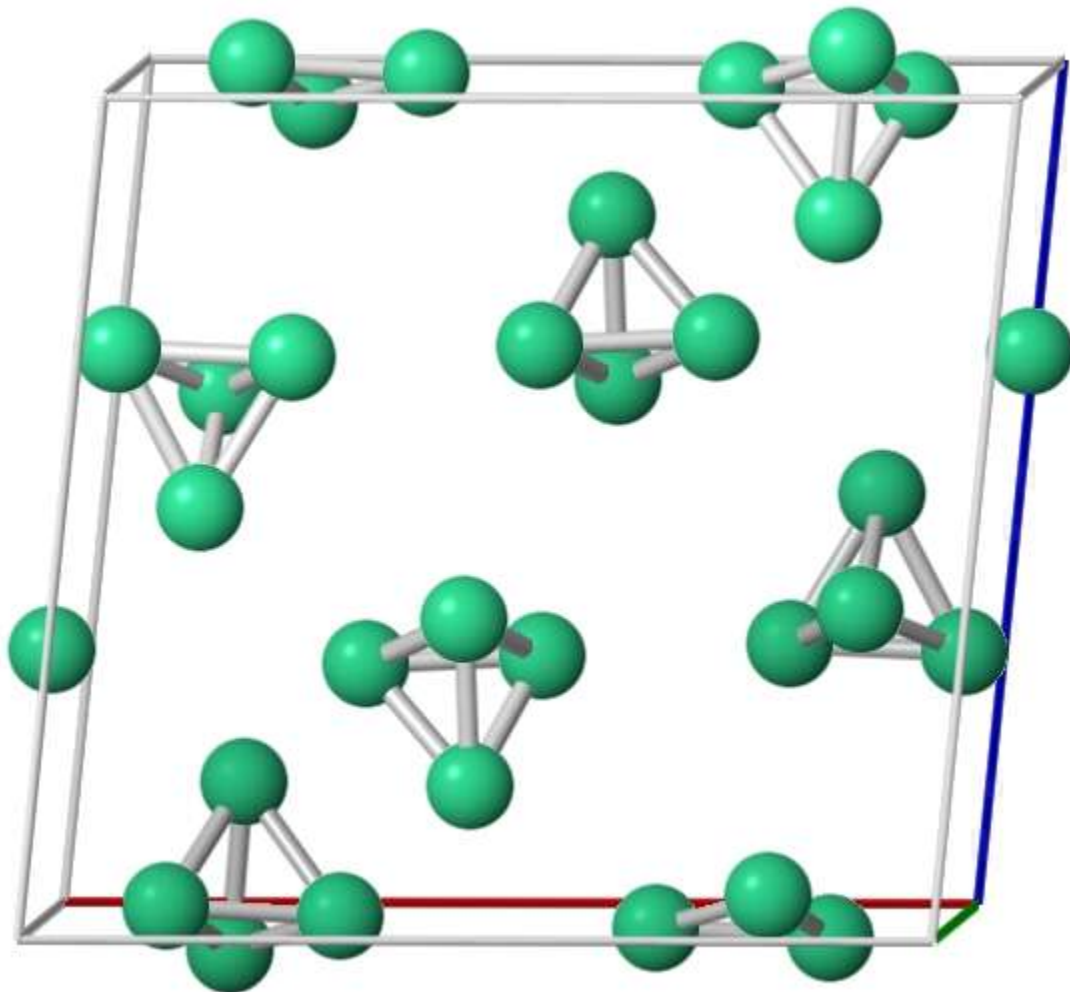
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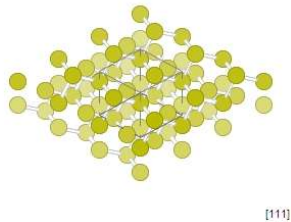
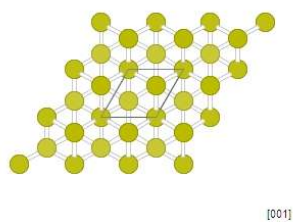
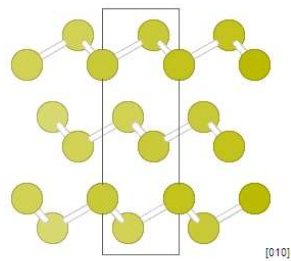
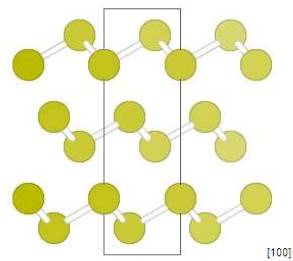
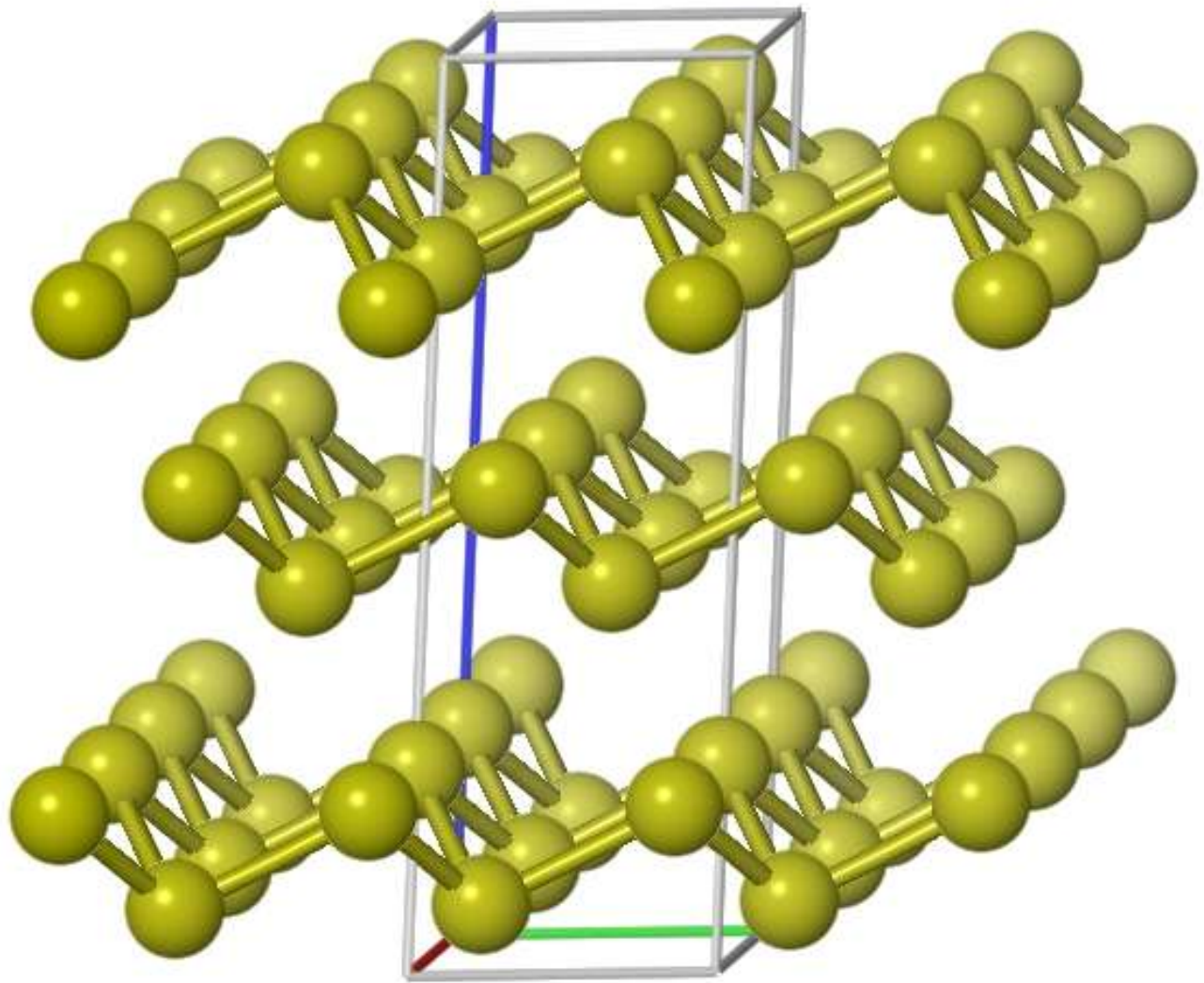
# *P* (Elements, Phosphorous-white)

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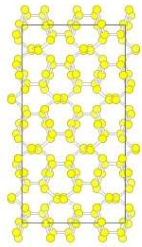
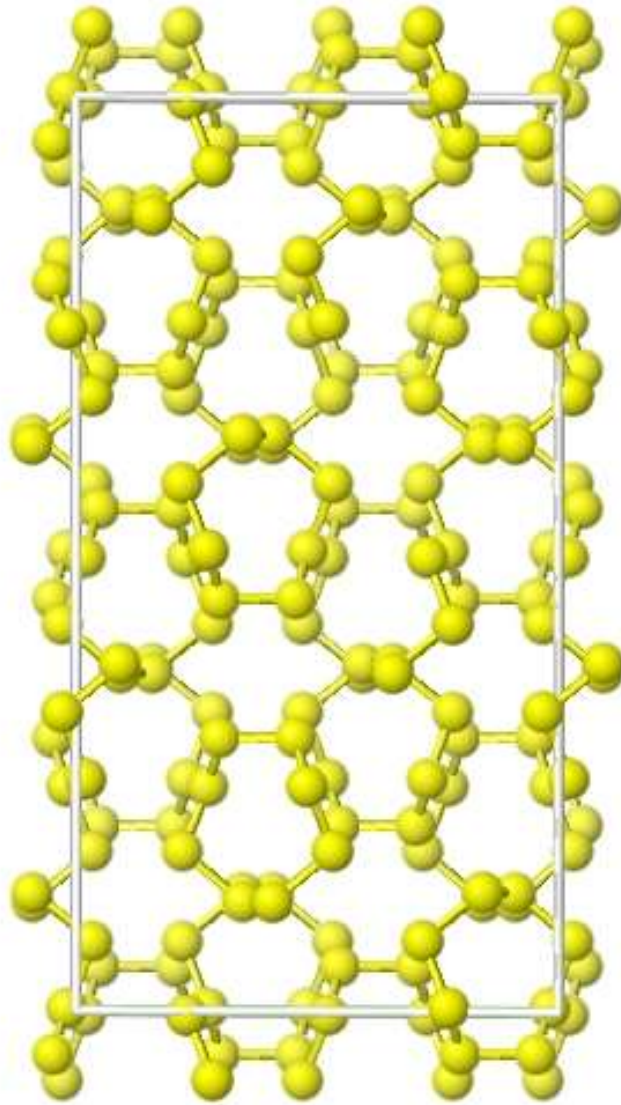
# *As* (Elements, Arsenic-grey)

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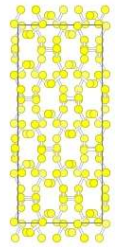


# $\alpha$ -S<sub>8</sub> (Elements, Sulphur)

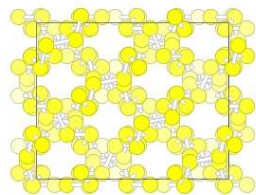
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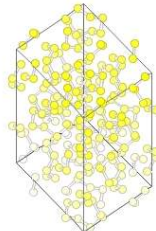
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[010]



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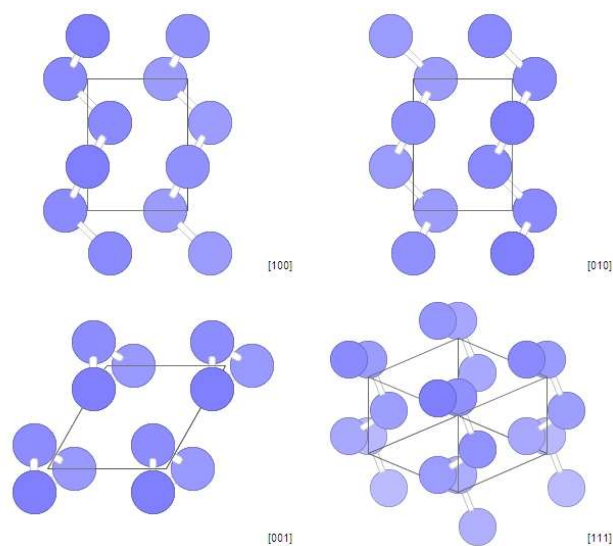
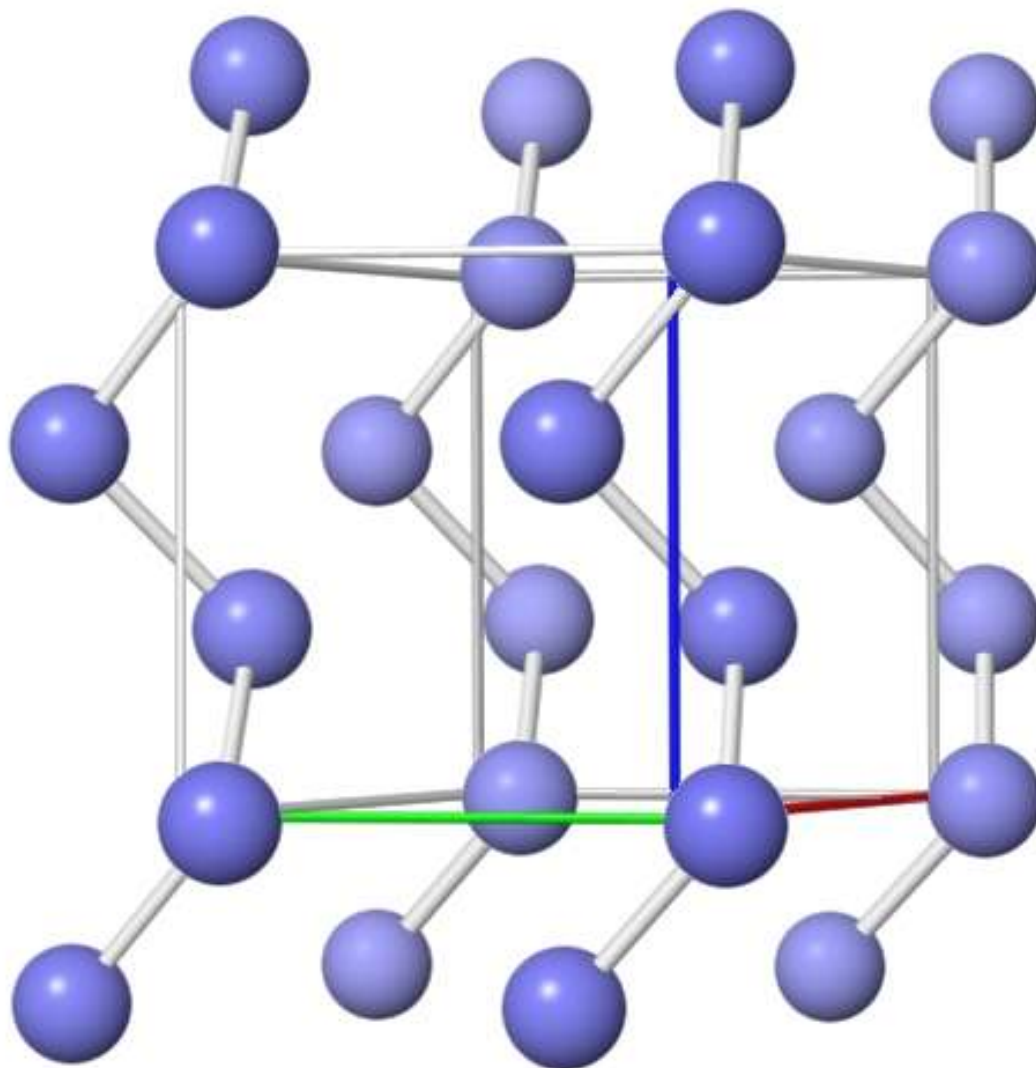


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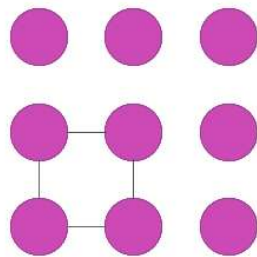
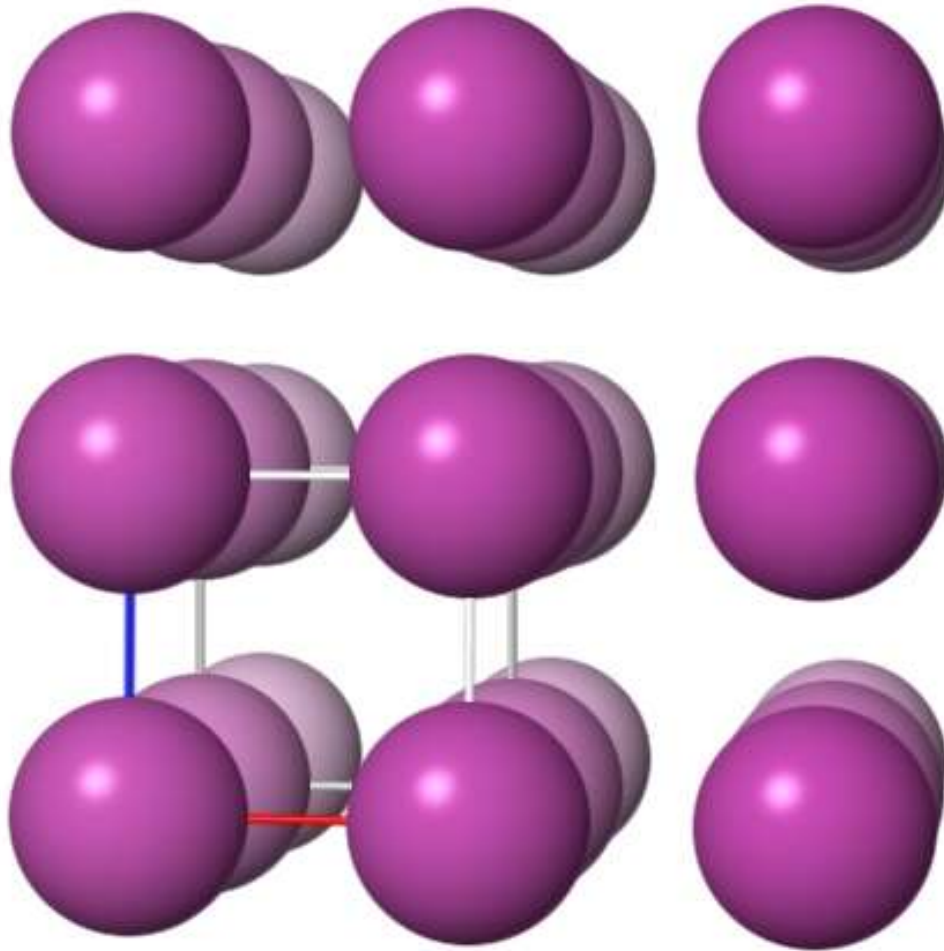
# *Se* (Elements, Selenium-grey)

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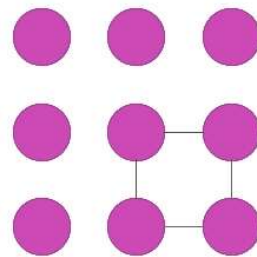


# $\alpha$ -Po (Elements, Polonium)

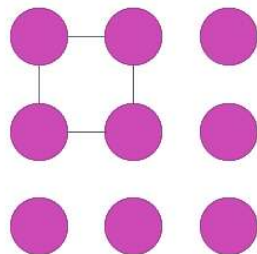
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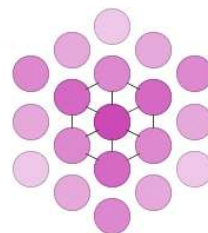
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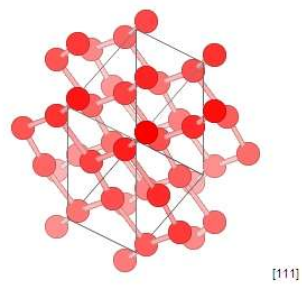
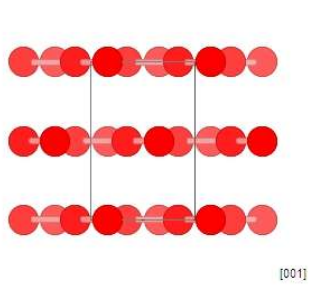
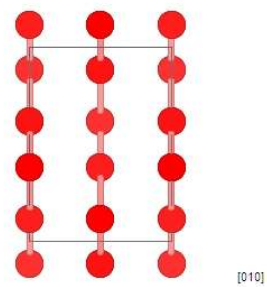
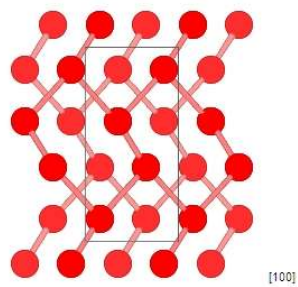
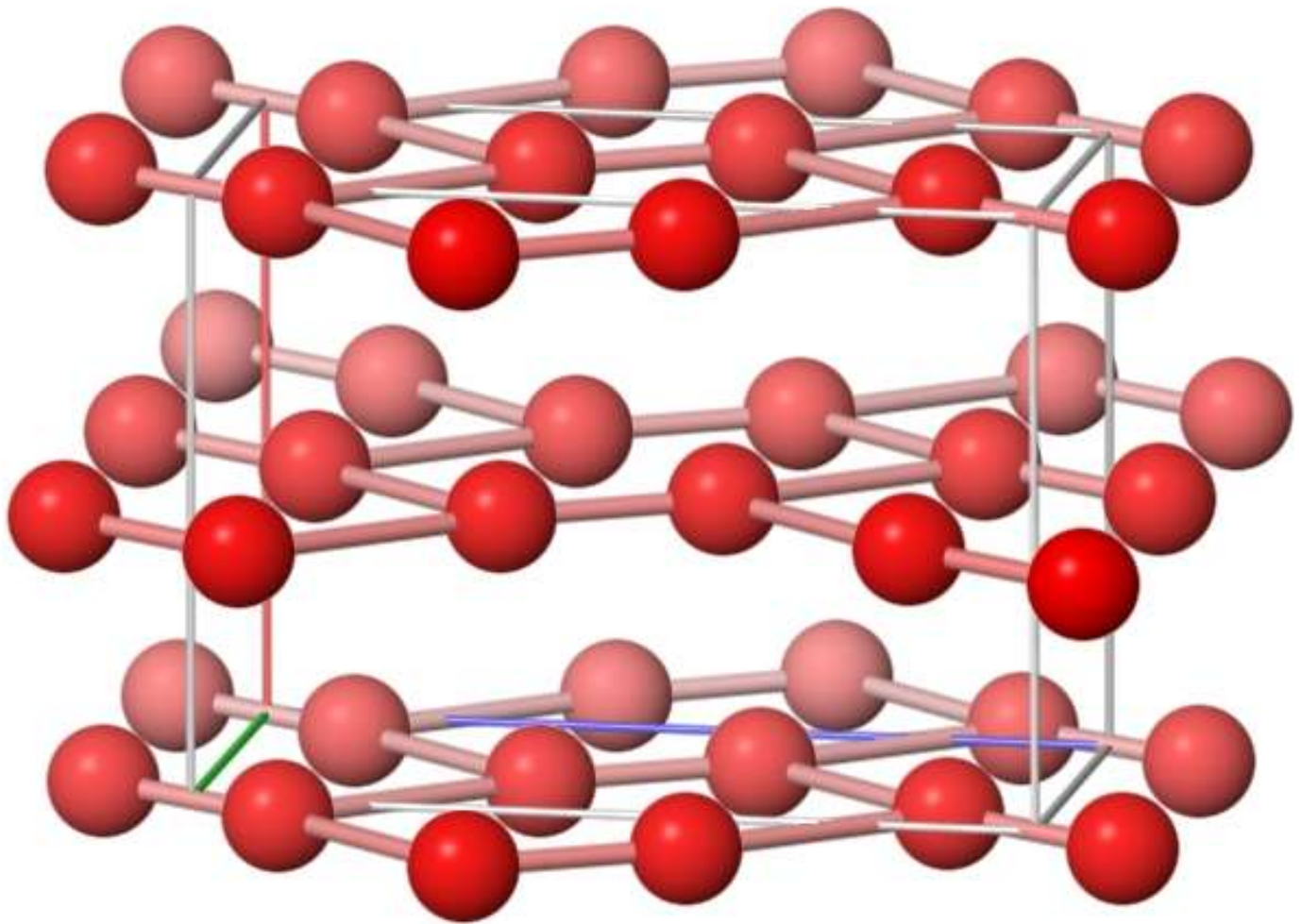


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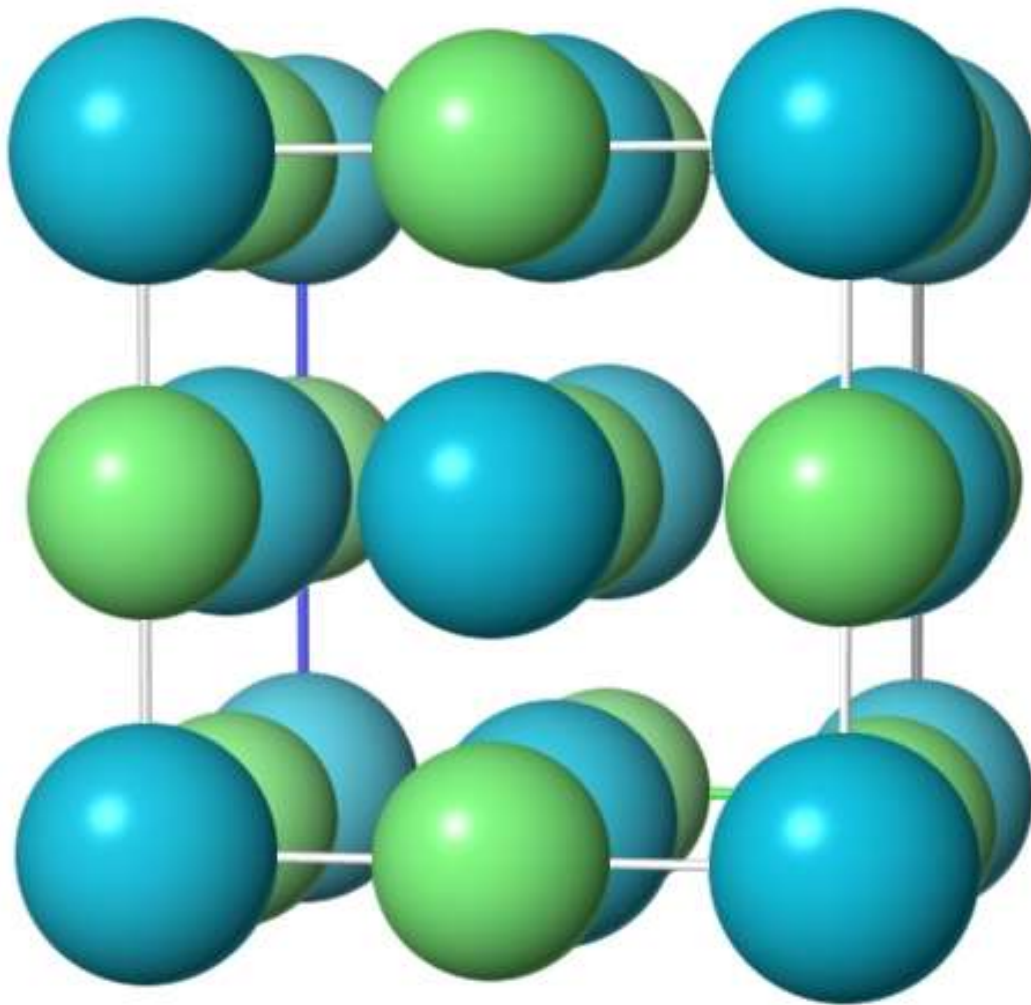
# $I_2$ (Elements, Iodine)

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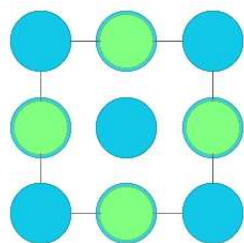


# ***NaCl*** (*AB, Halite*)

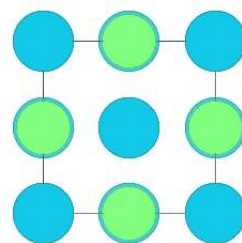
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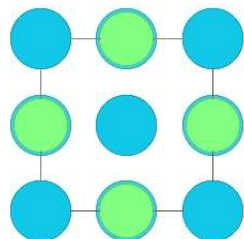
● Cl  
● Na



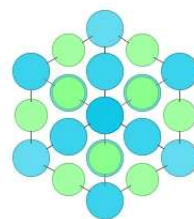
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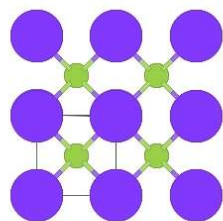
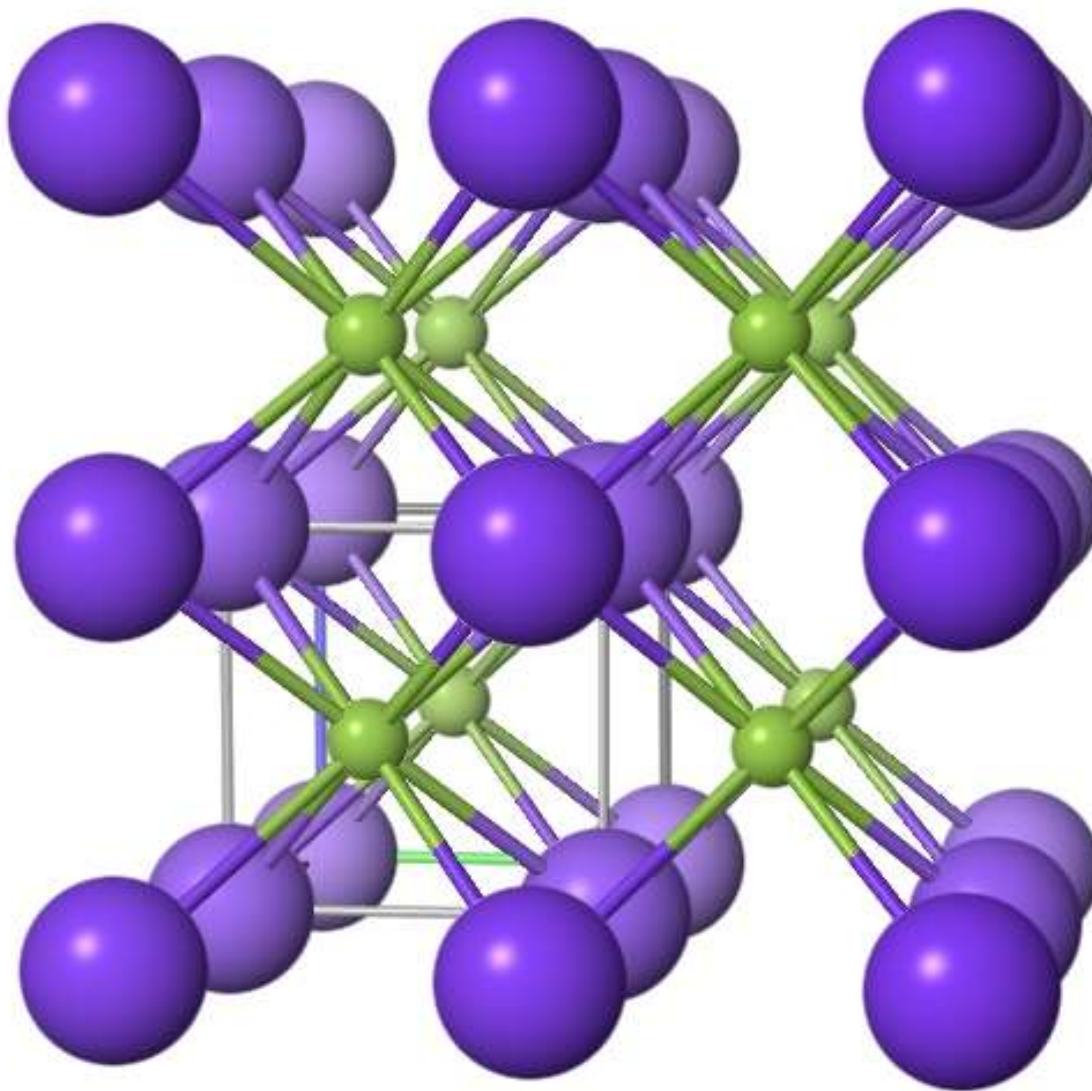
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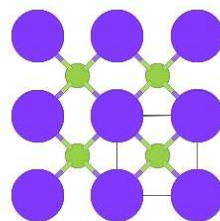
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# $CsCl$ (AB)

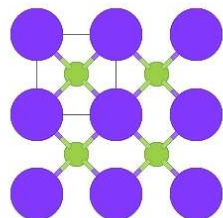
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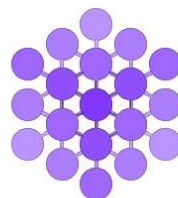
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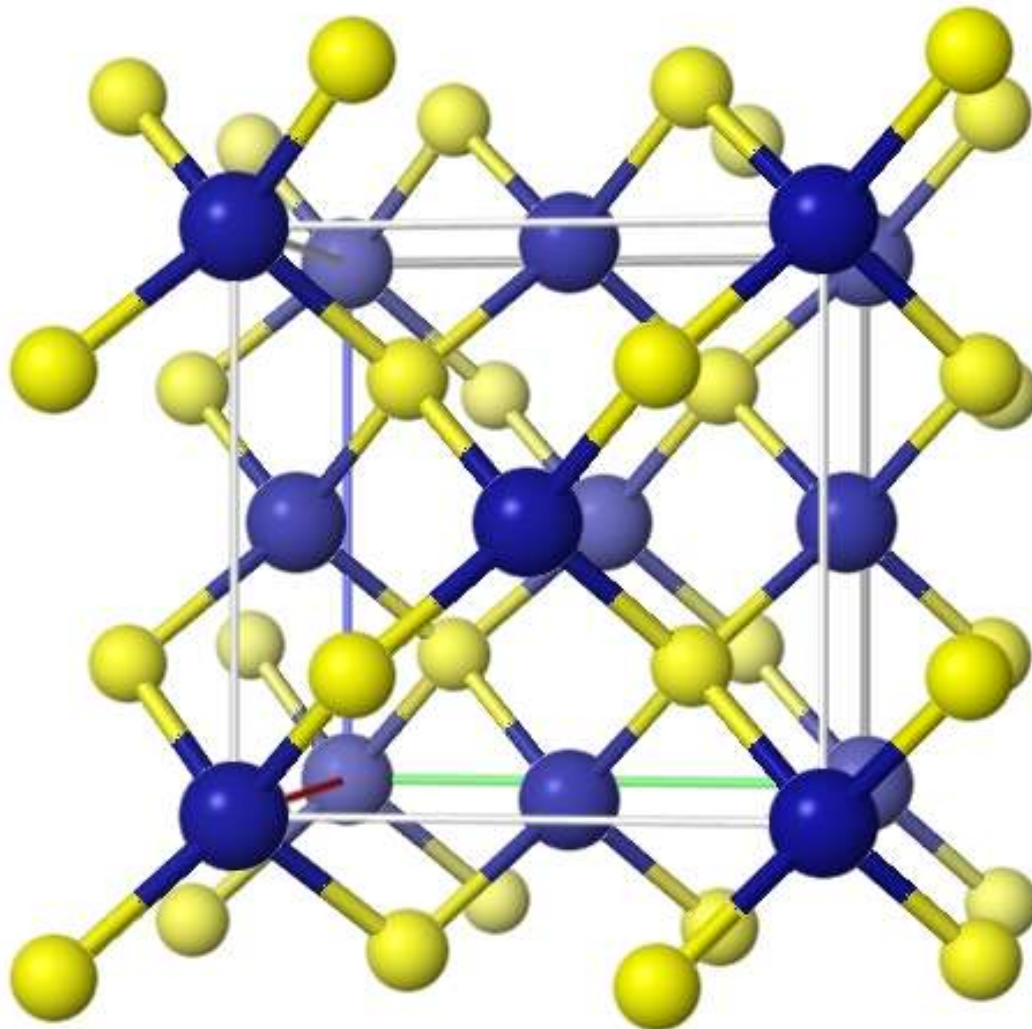
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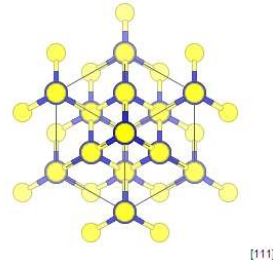
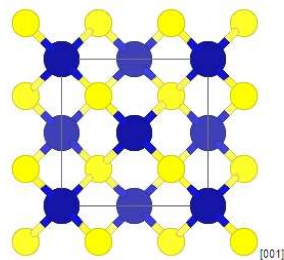
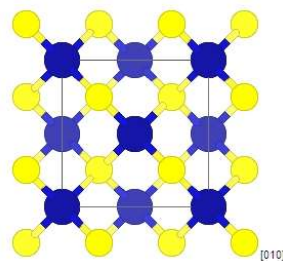
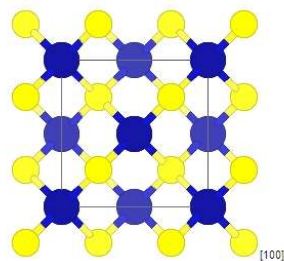
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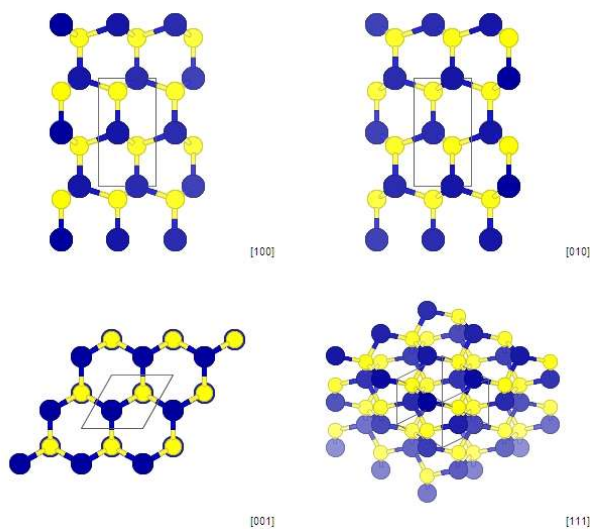
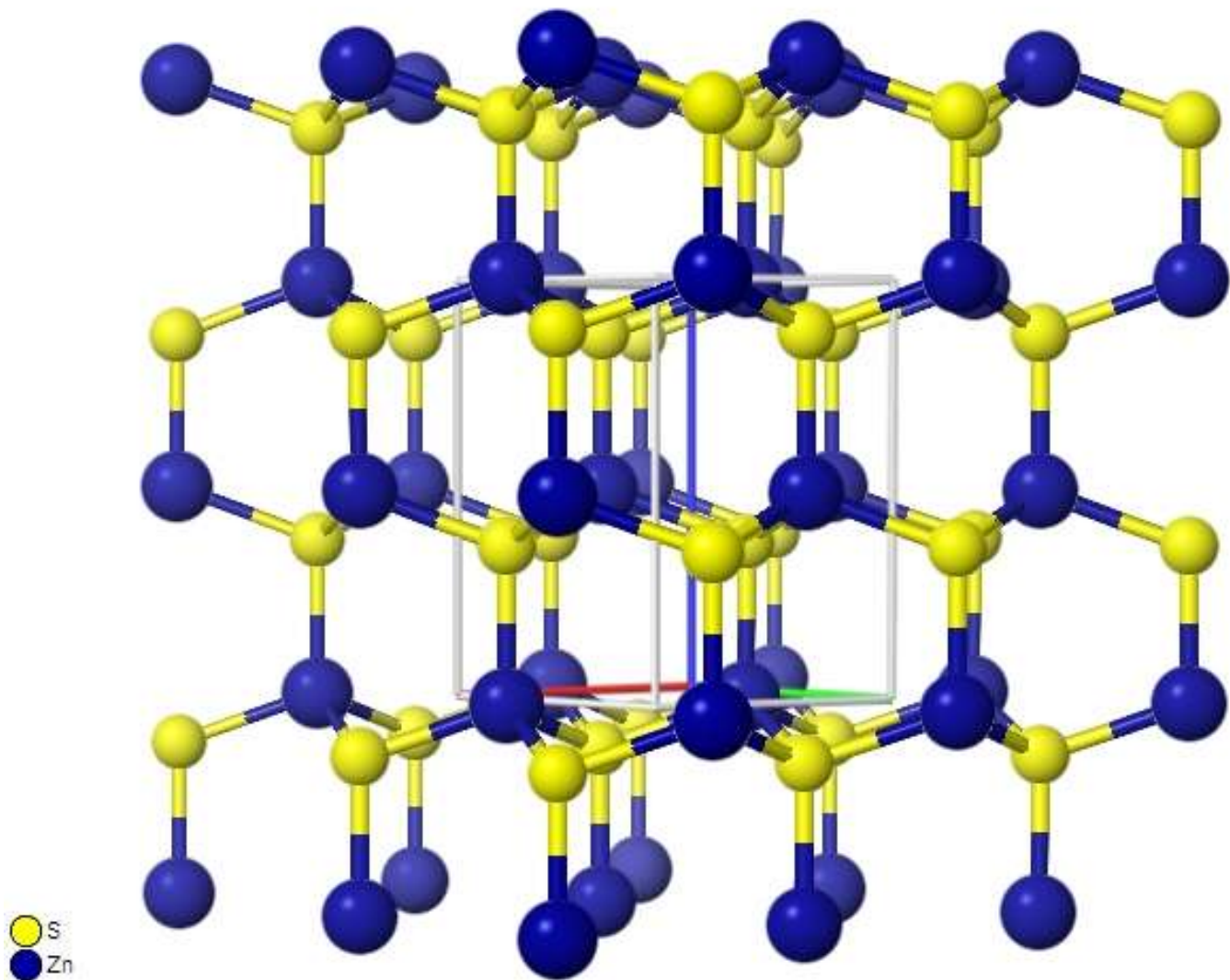
# $ZnS$ (*AB*, Sphalerite)



● S  
● Zn

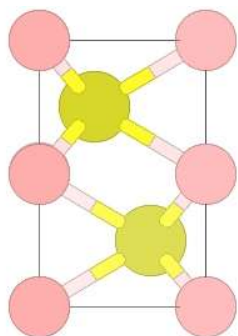
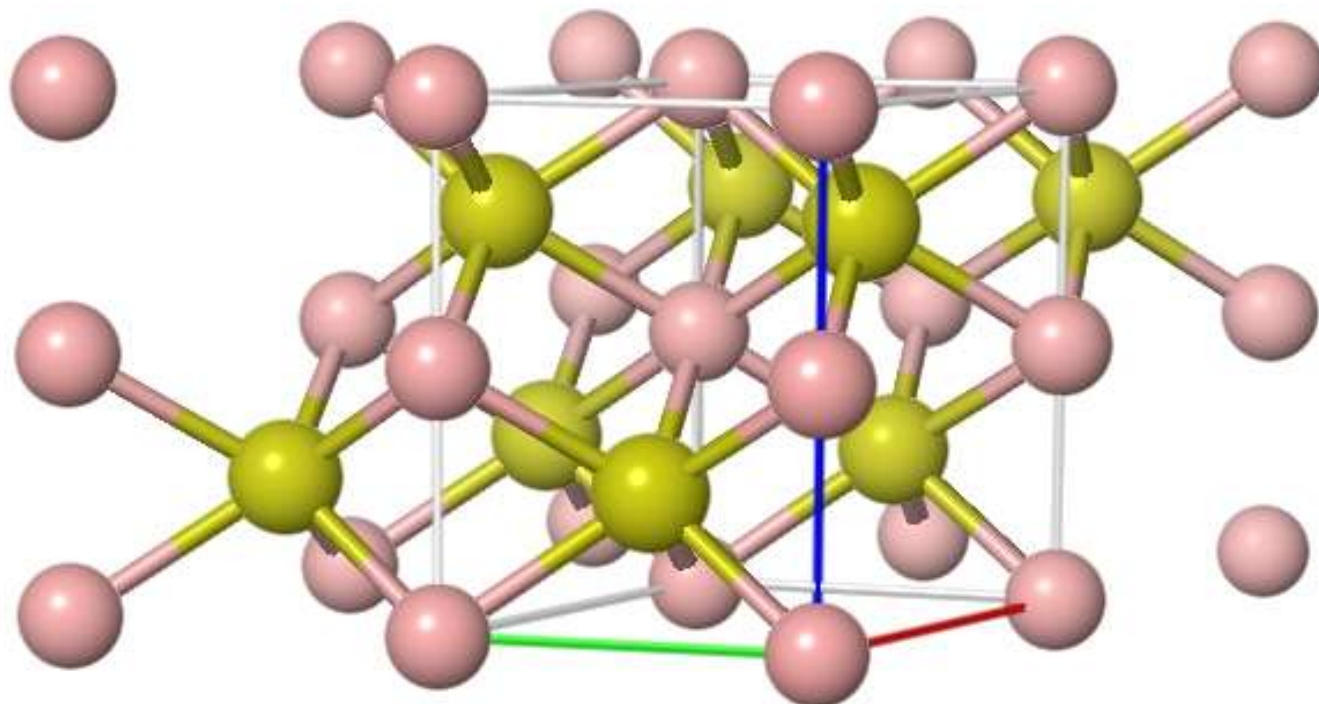


# $ZnS$ (*AB*, Wurtzite)

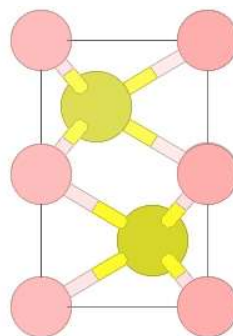


# *NiAs* (AB)

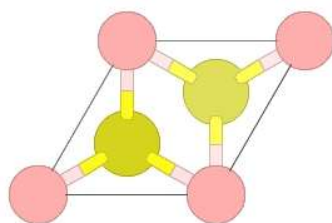
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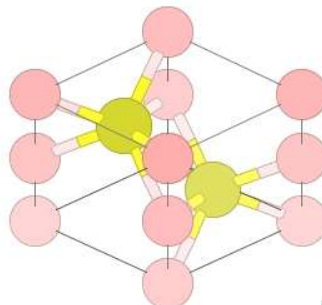
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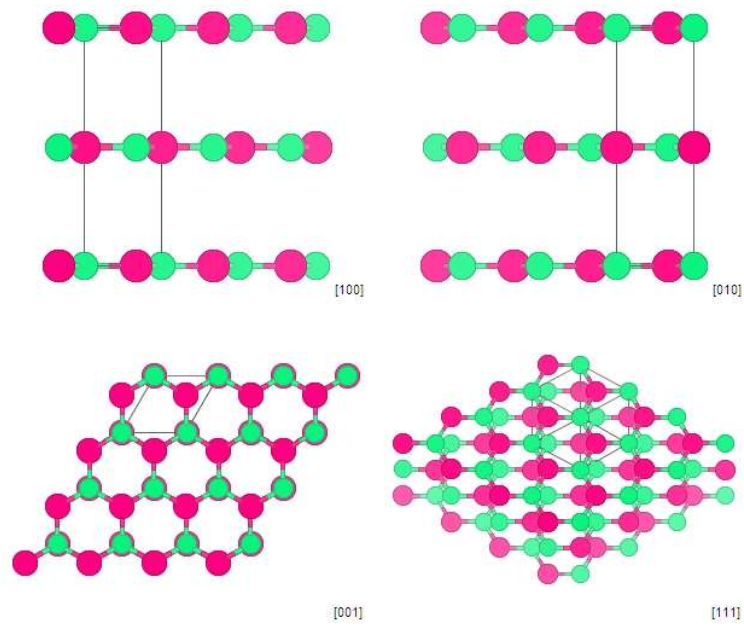
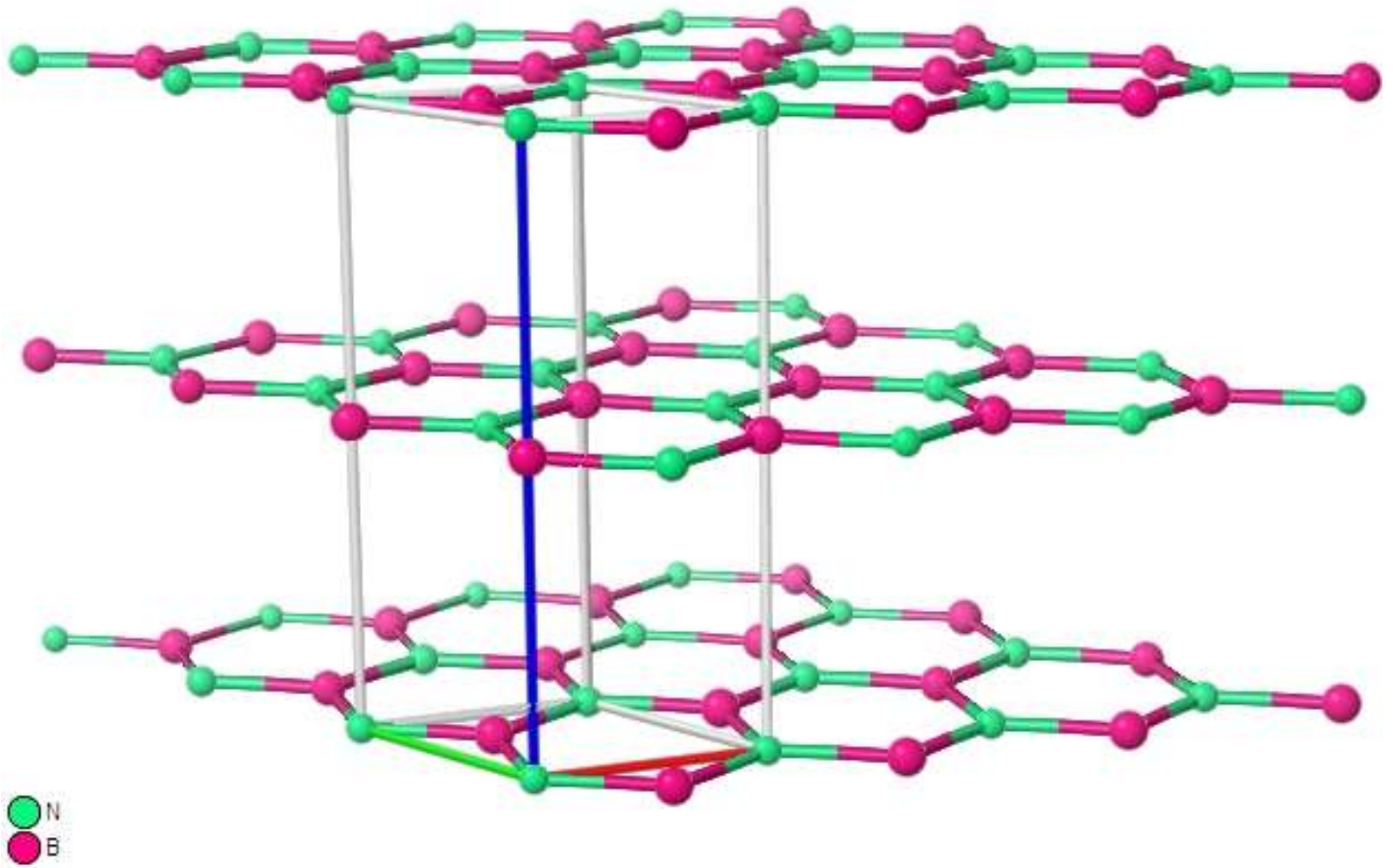


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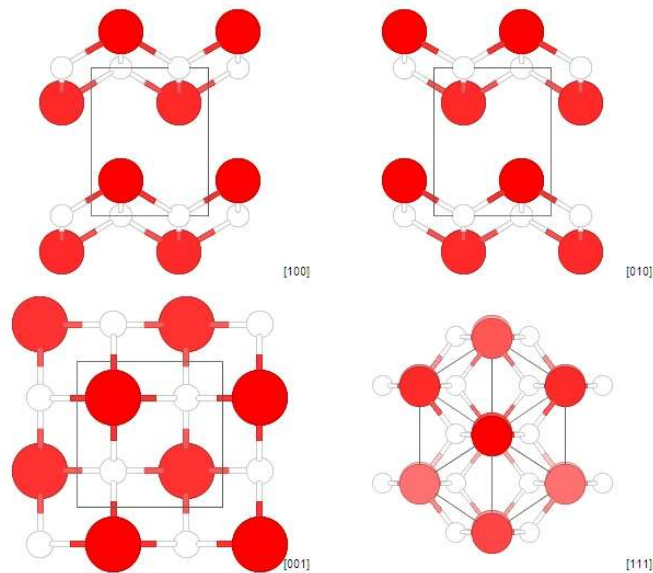
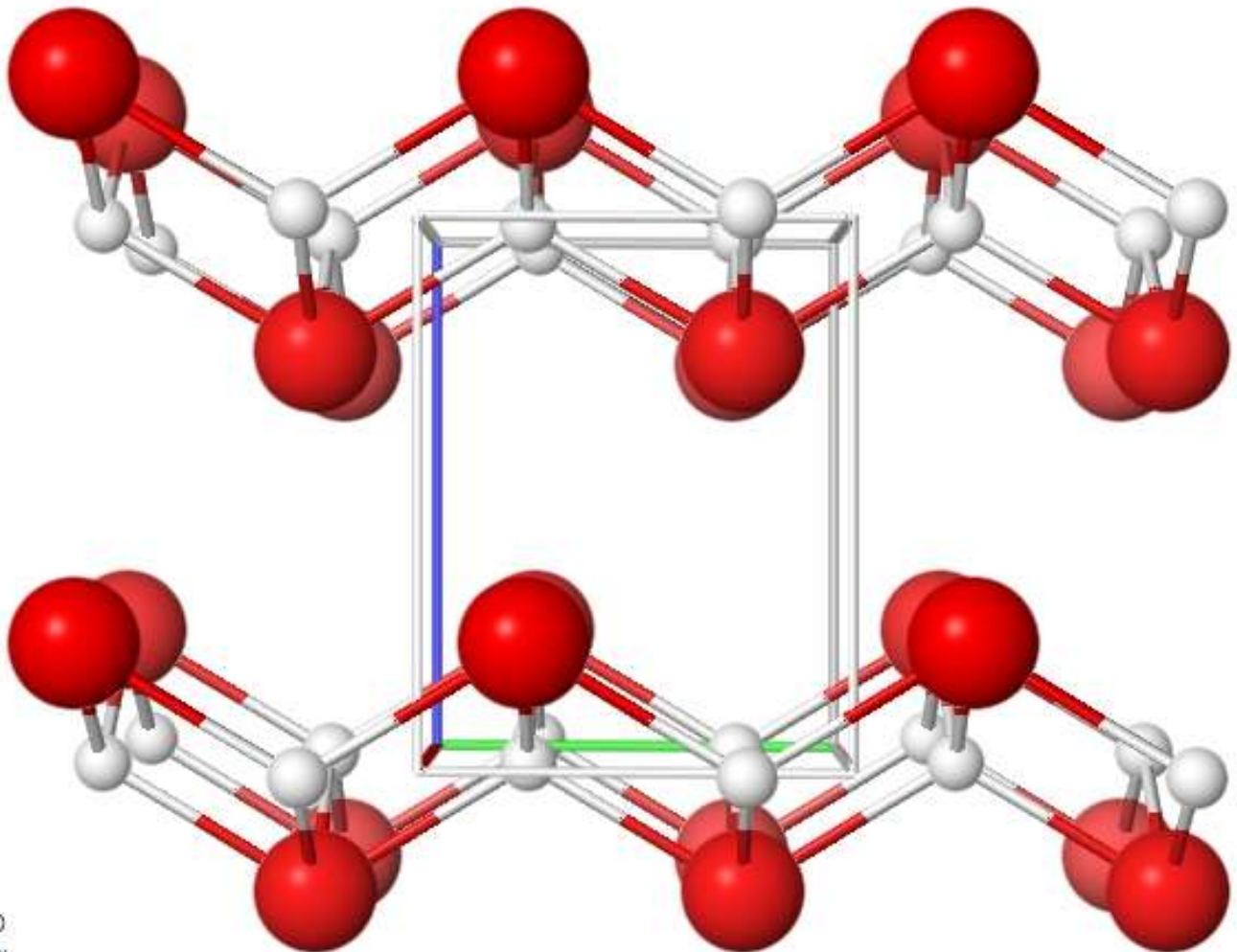


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# $\alpha$ -BN (*AB*)

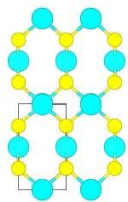
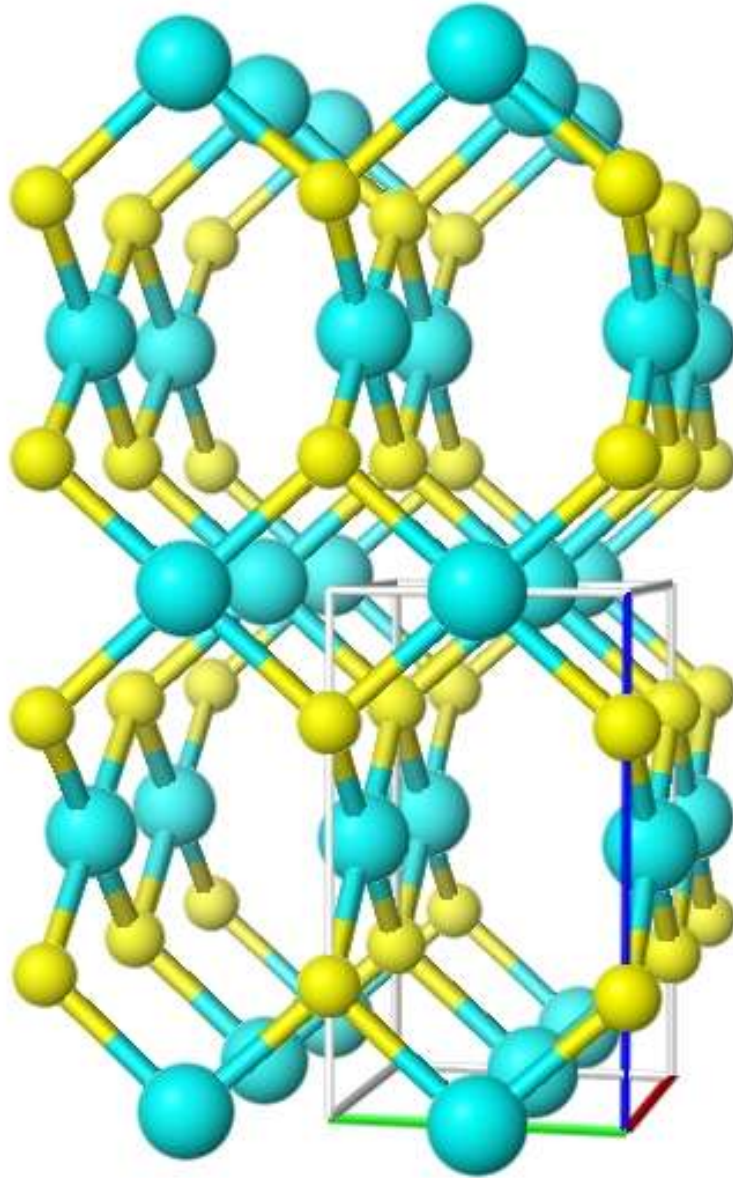


# *PbO* (*AB*, *PbO-red*)

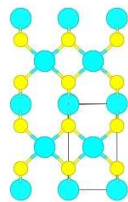


# $PtS$ (AB)

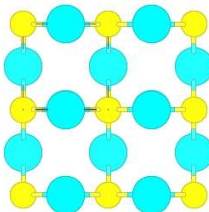
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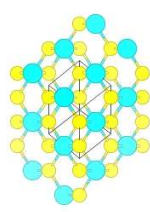
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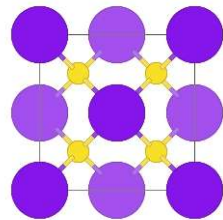
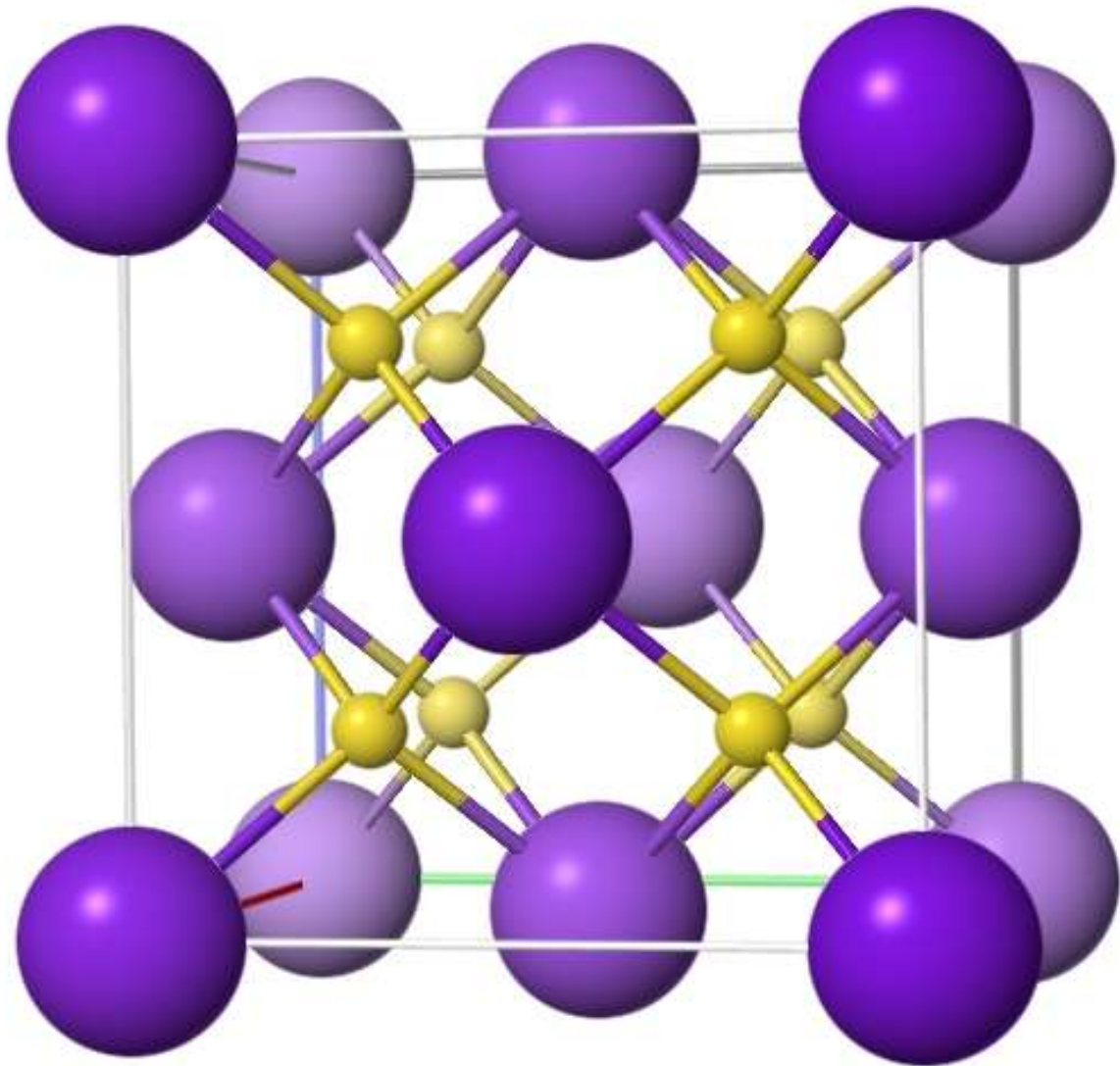


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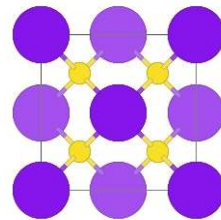


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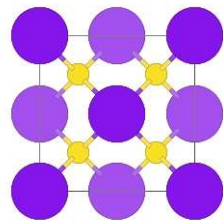
# $CaF_2$ ( $AB_2$ , Fluorite)



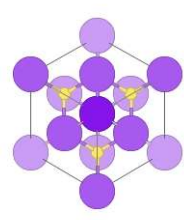
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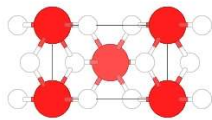
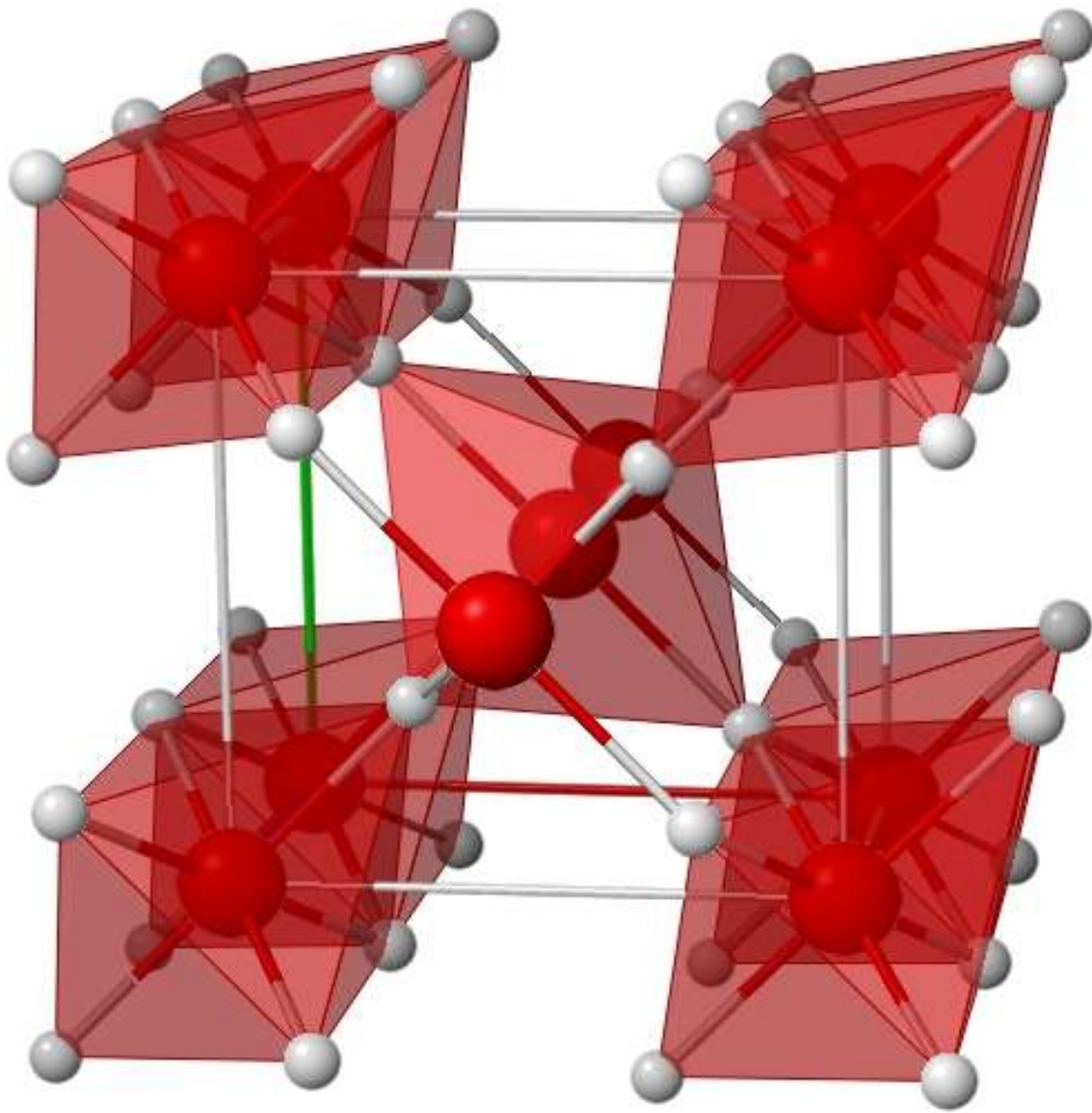


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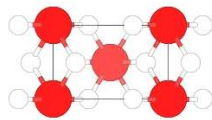


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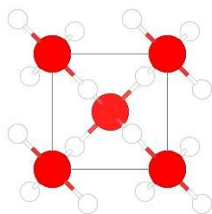
# $TiO_2$ ( $AB_2$ , Rutile)



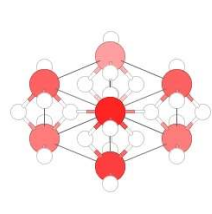
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[010]



[001]

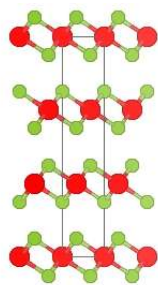
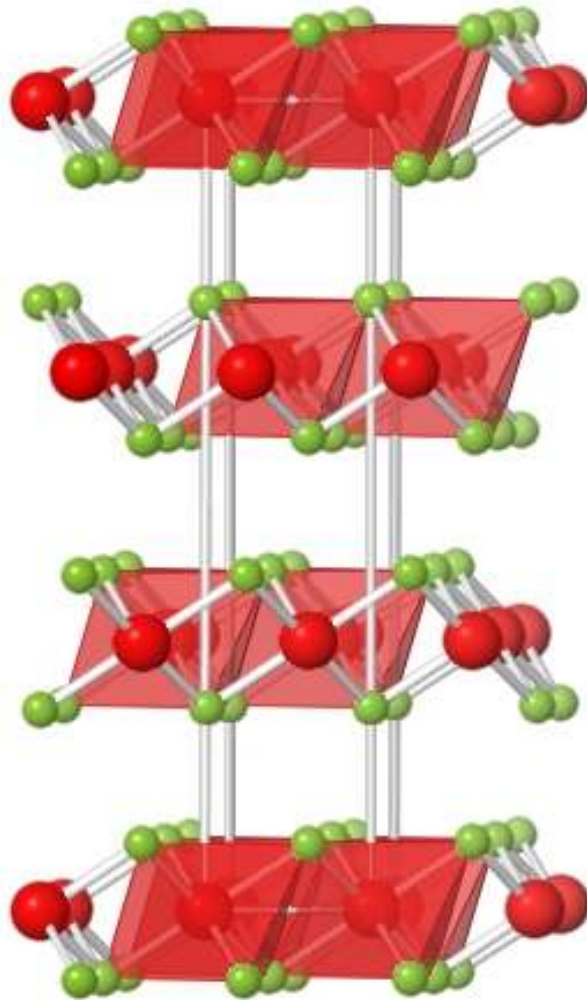


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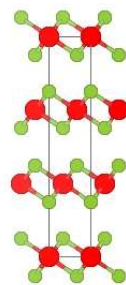


# $CdCl_2$ ( $AB_2$ )

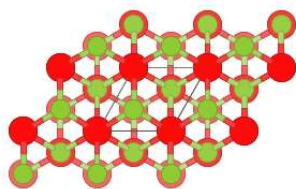
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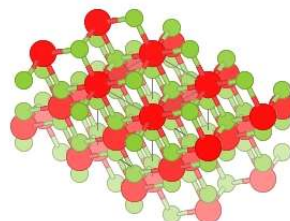
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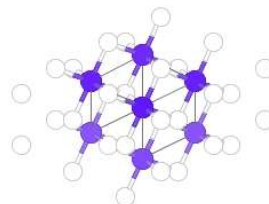
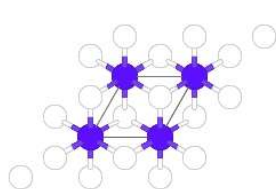
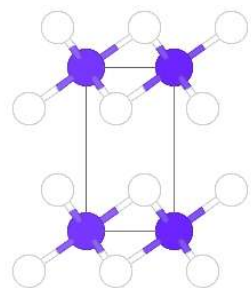
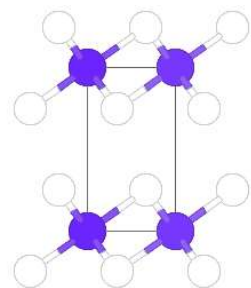
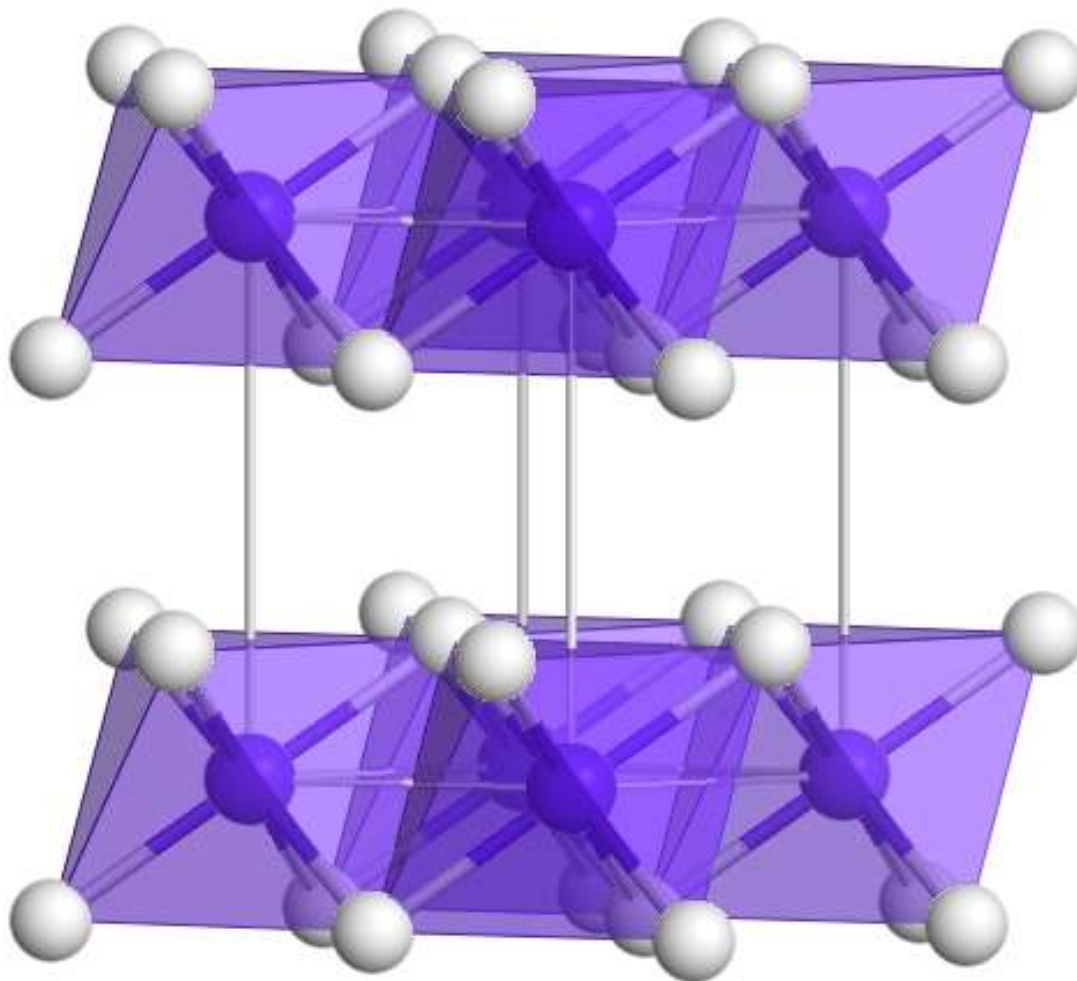
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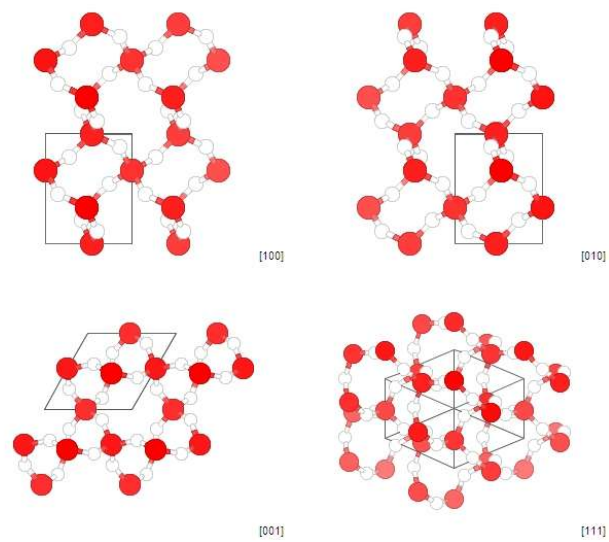
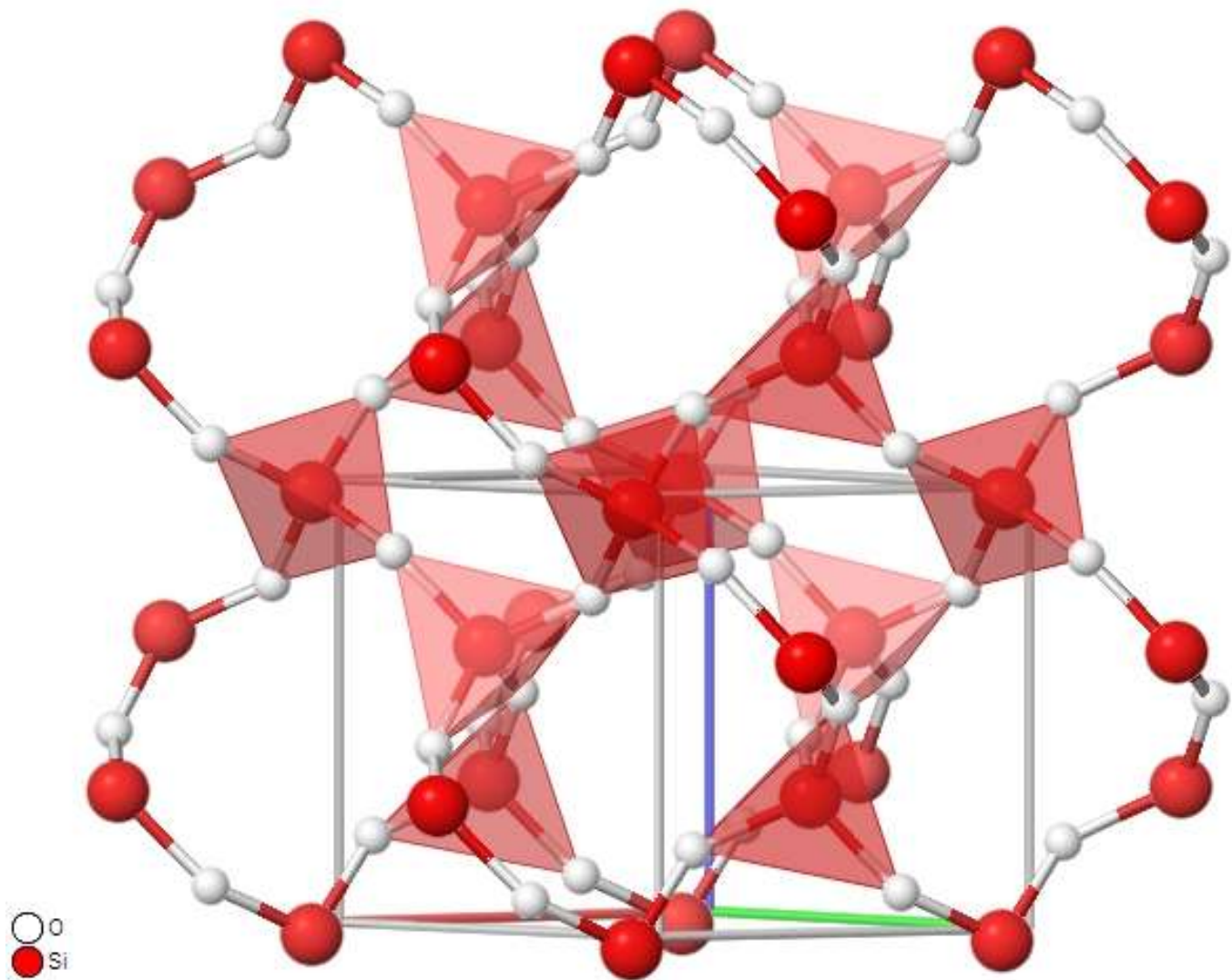
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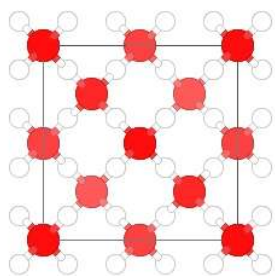
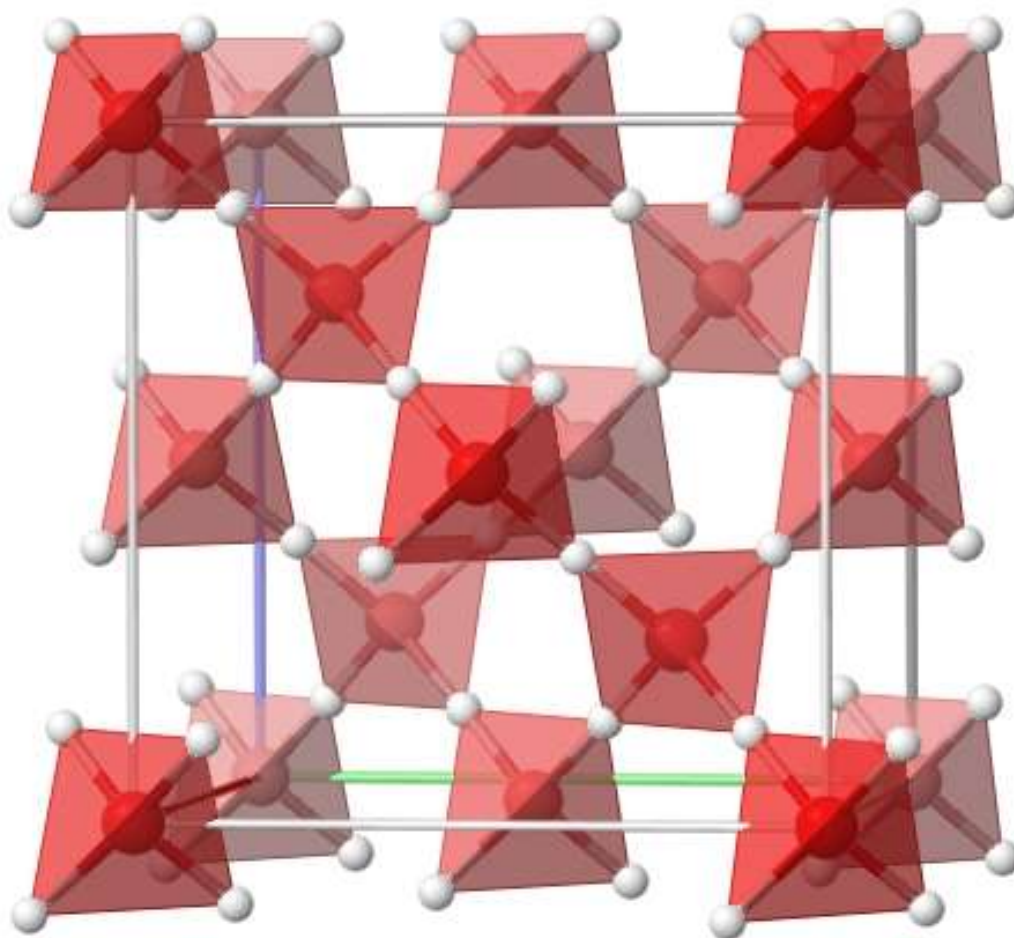
# $CdI_2$ ( $AB_2$ )



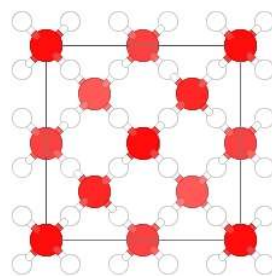
# $SiO_2$ ( $AB_2$ , Quartz)



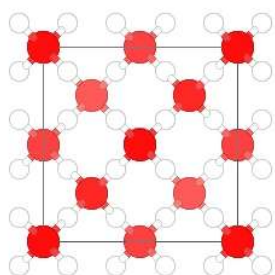
# $SiO_2$ ( $AB_2$ , Cristobalite)



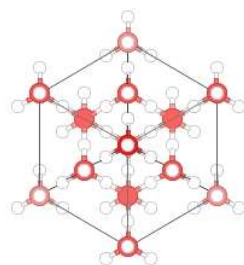
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[010]

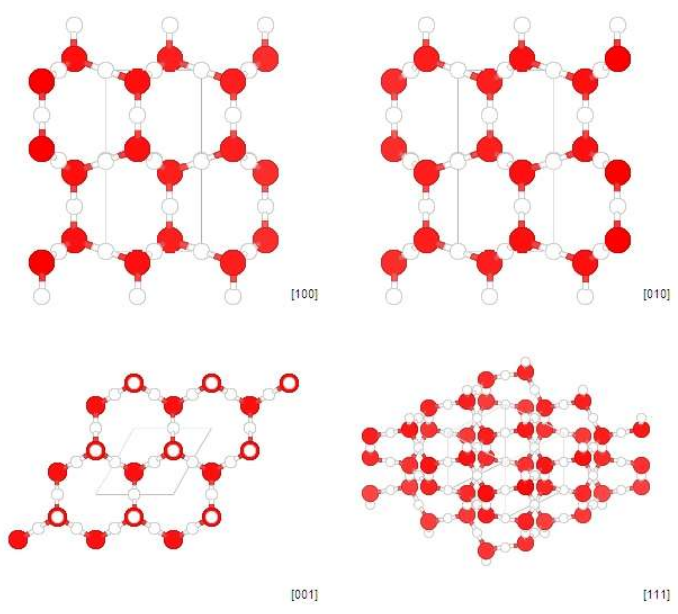
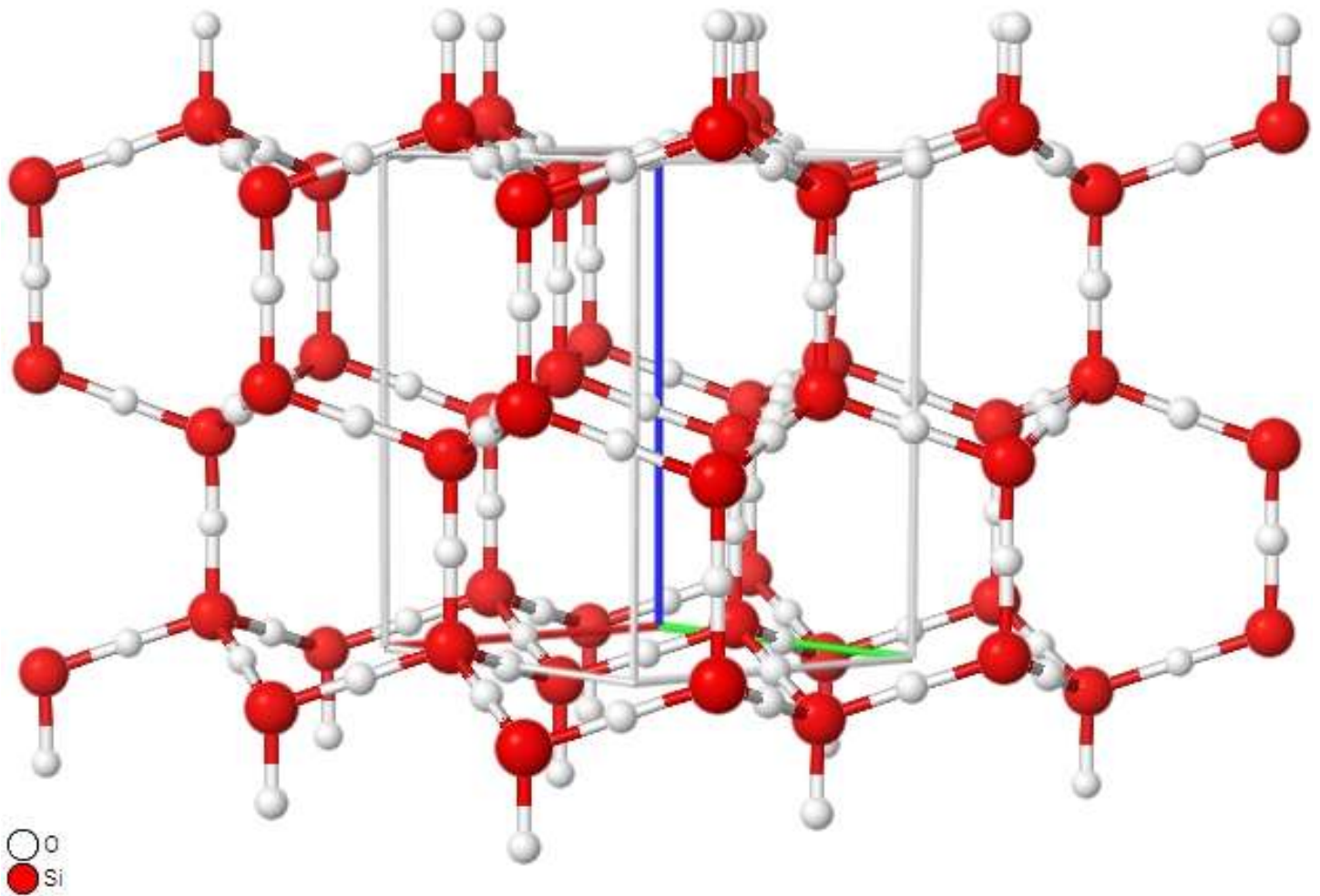


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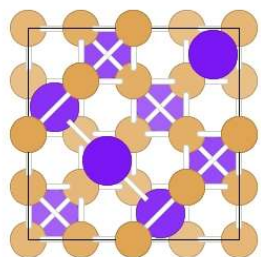
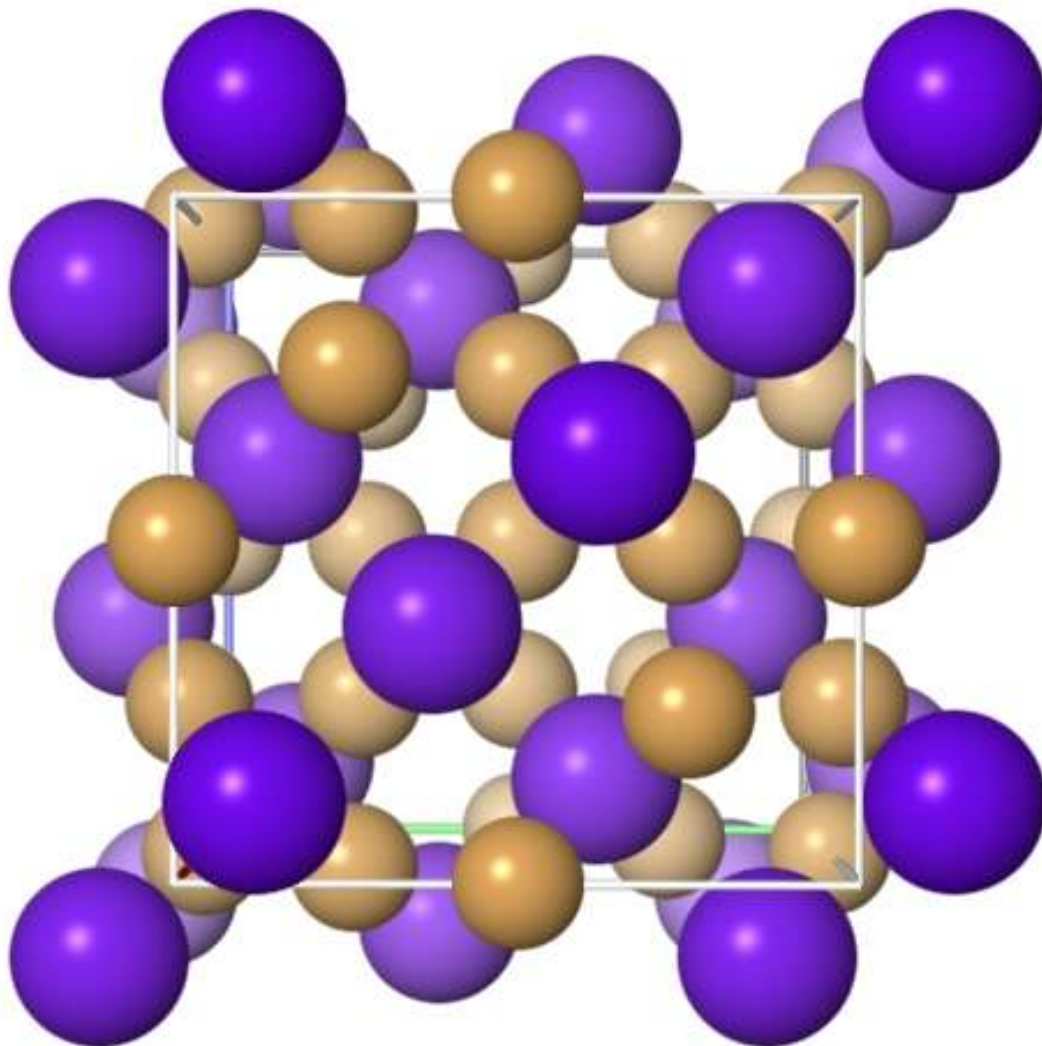


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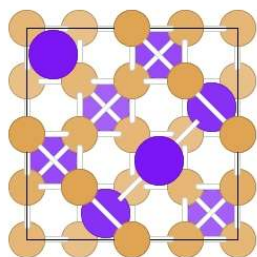
# $SiO_2$ ( $AB_2$ , Tridymite)



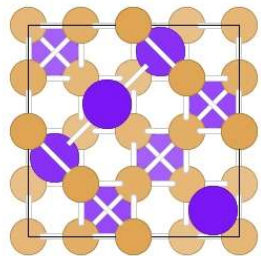
# $MgCu_2$ ( $AB_2$ )



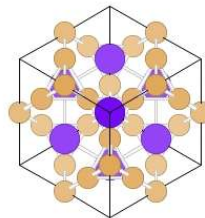
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$[010]$



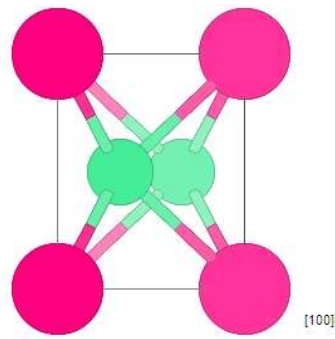
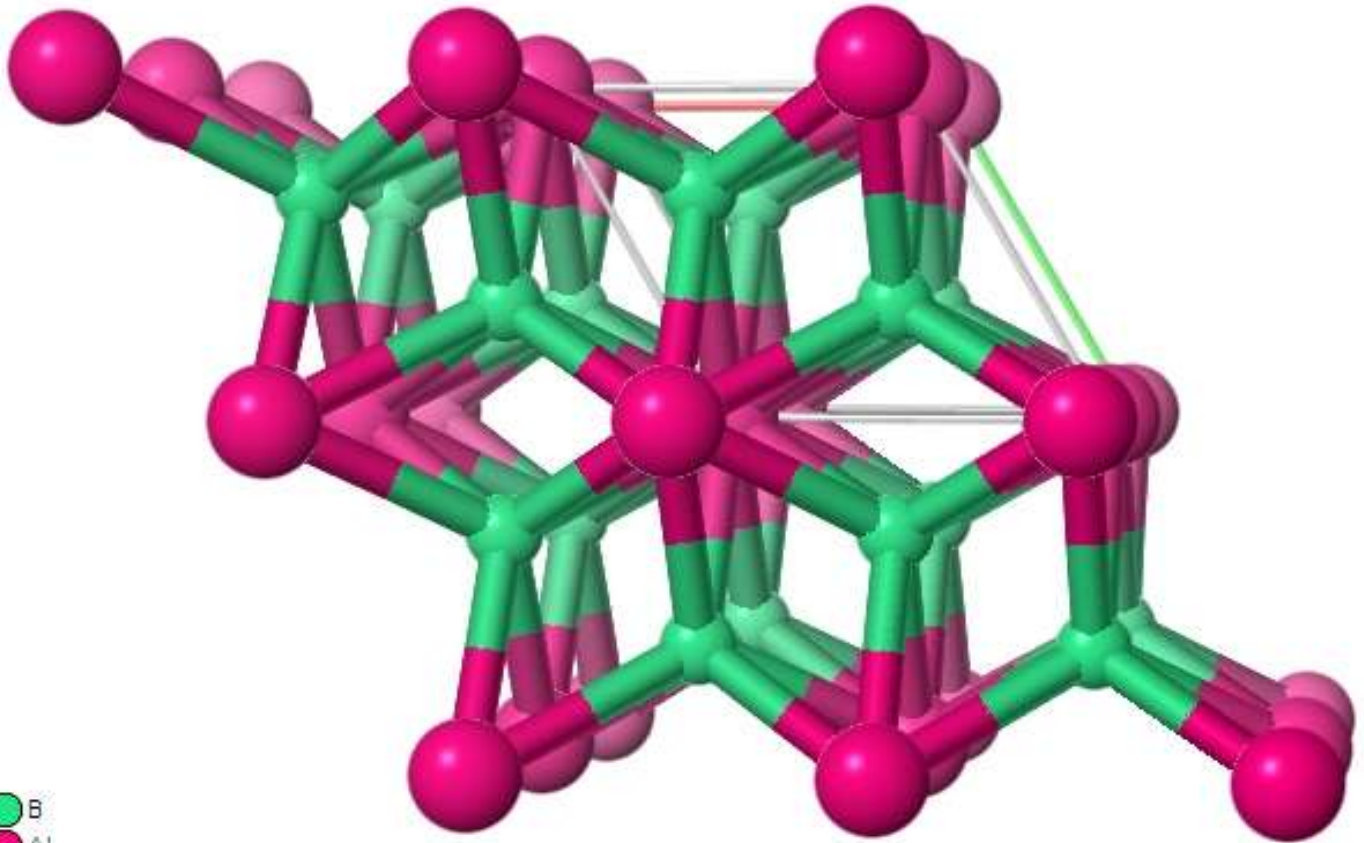
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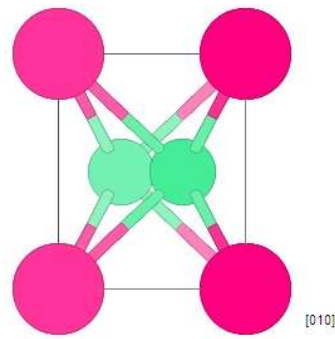
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# $AlB_2$ ( $AB_2$ )

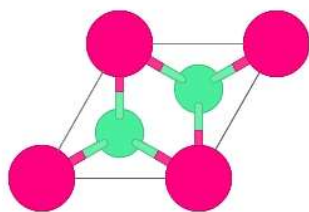
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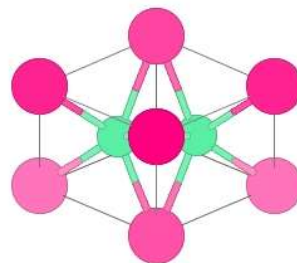
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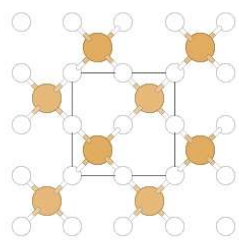
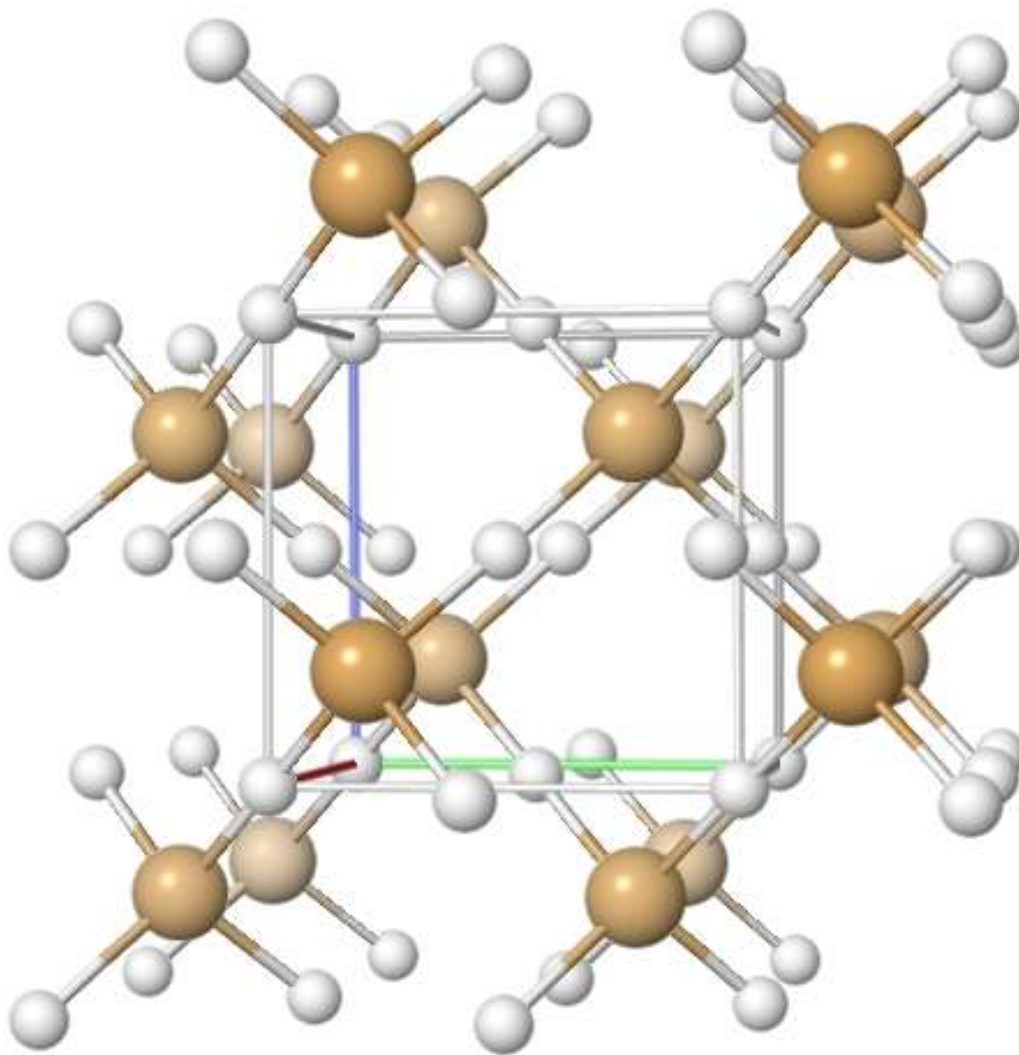


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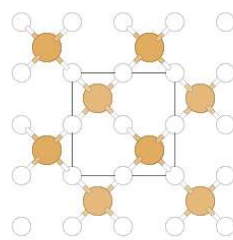


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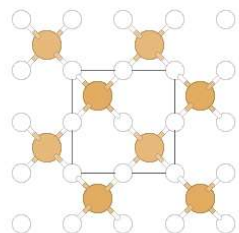
# $Cu_2O$ ( $AB_2$ )



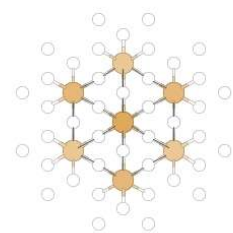
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[010]



[001]

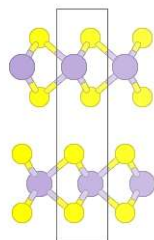
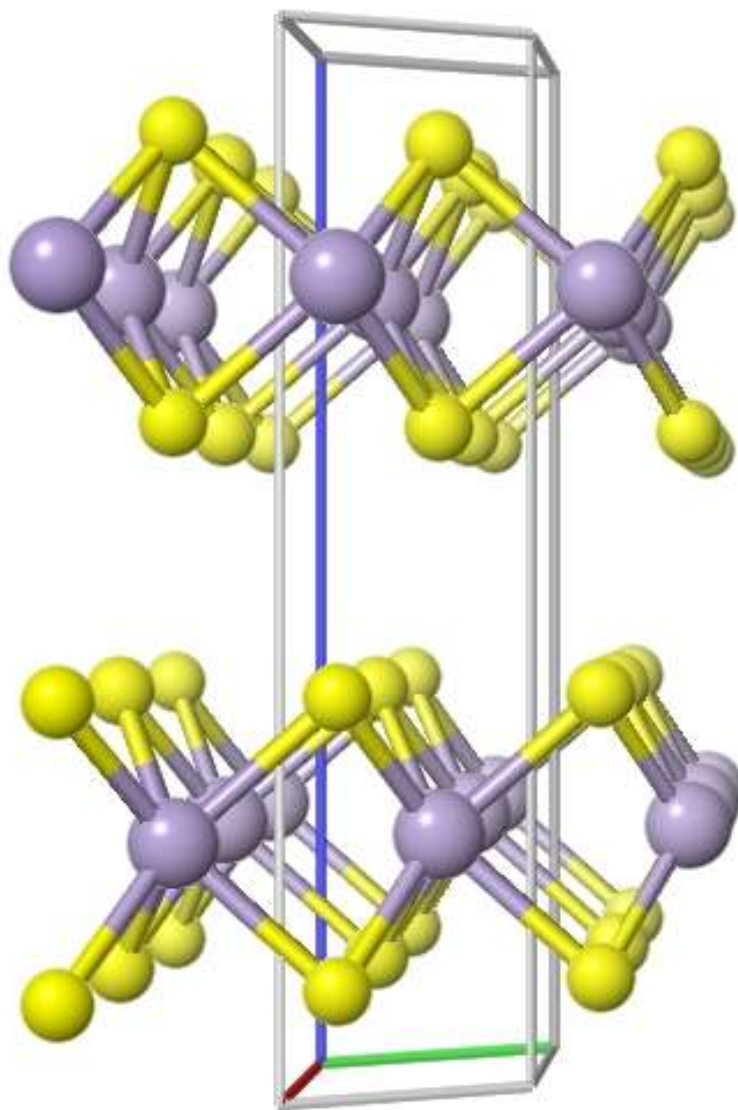


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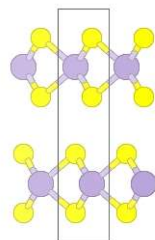


# $MoS_2$ ( $AB_2$ )

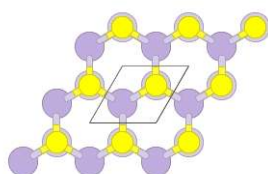
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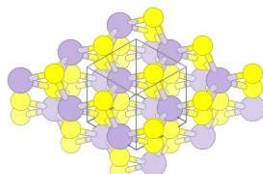
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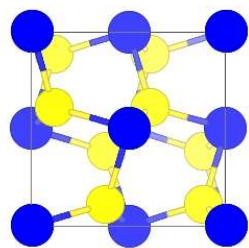
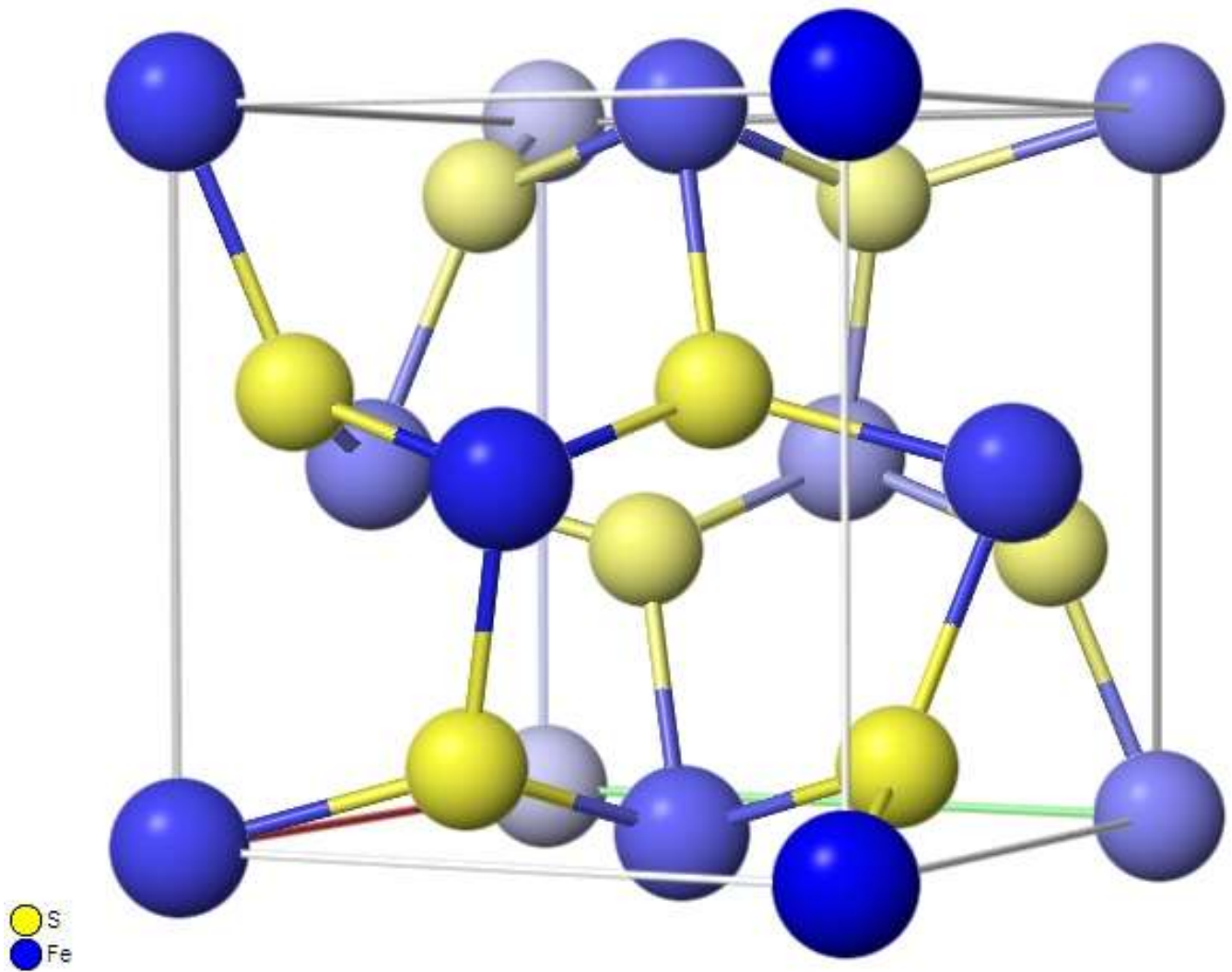
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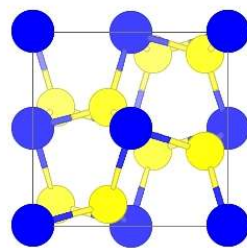
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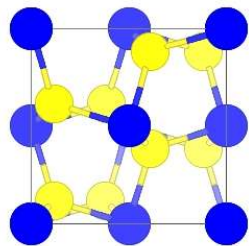
# $FeS_2$ ( $AB_2$ , Pyrite)



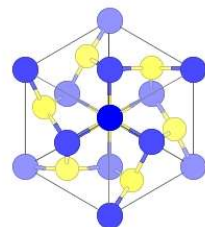
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[010]



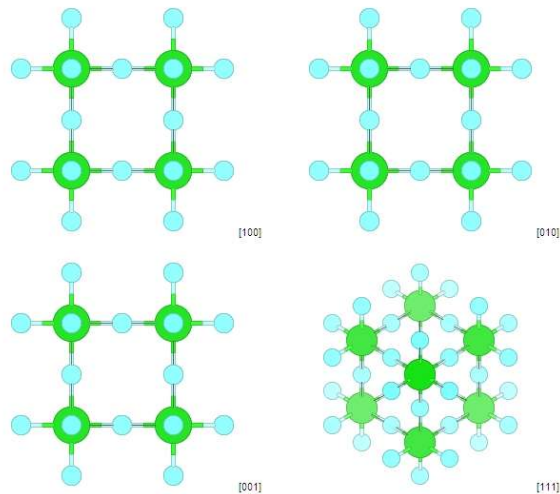
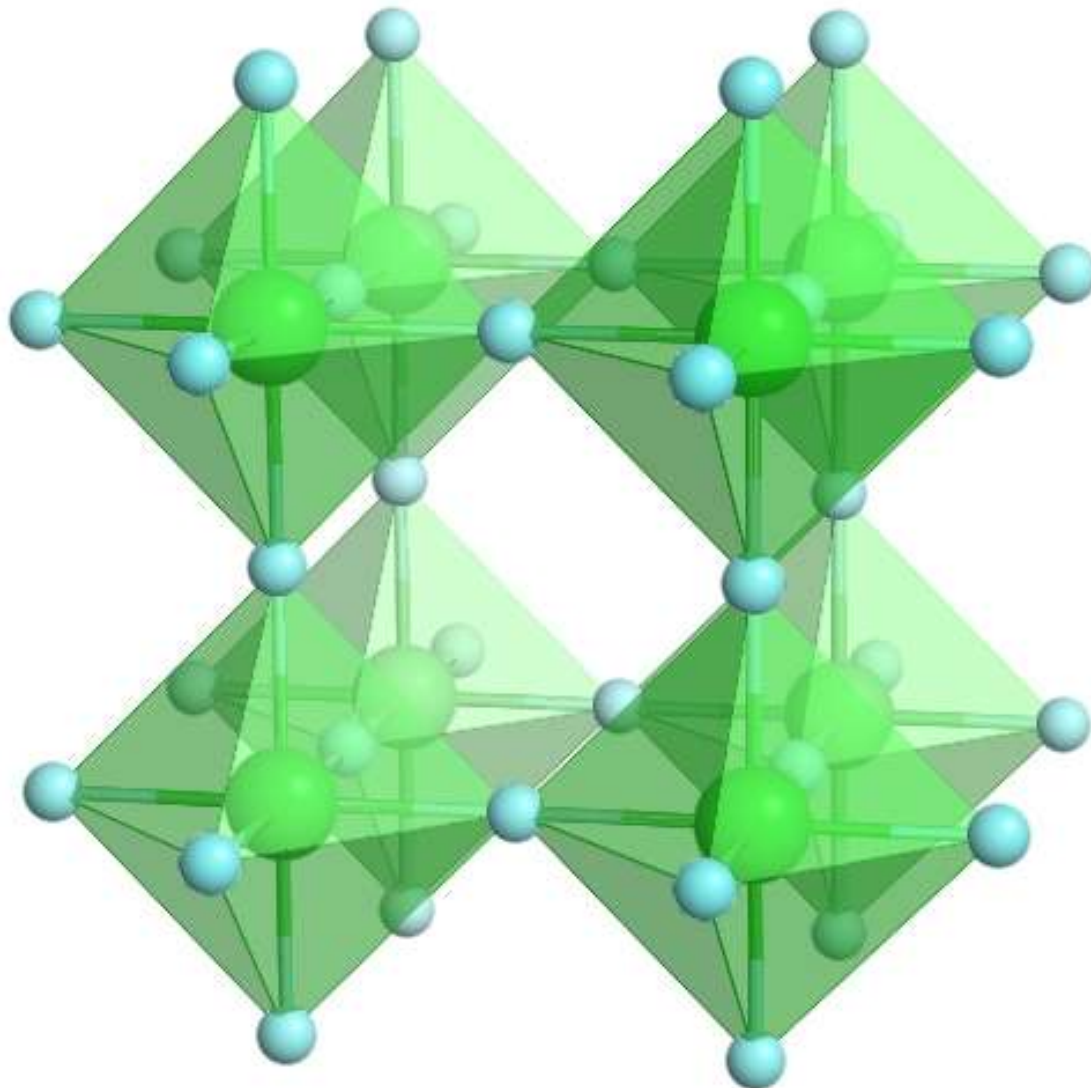
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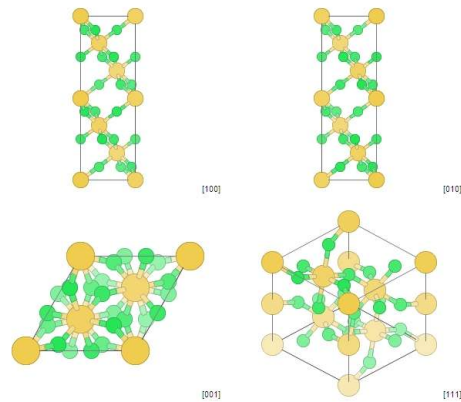
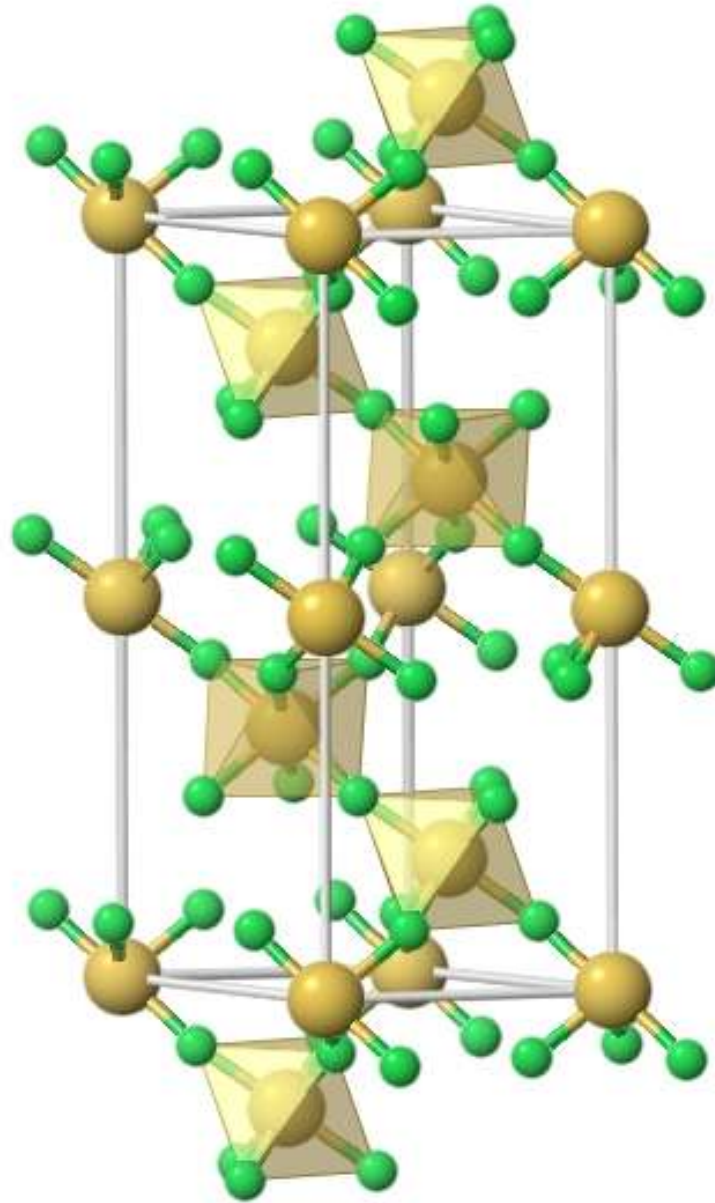
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# $ReO_3$ ( $AB_3$ )

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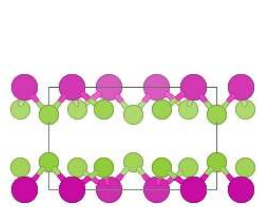
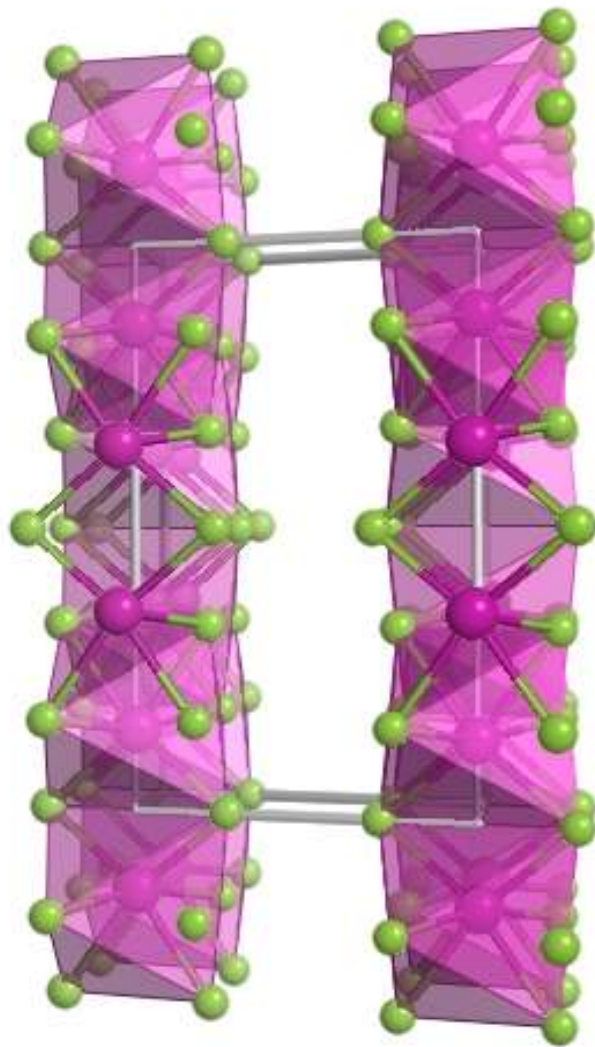


# $VF_3$ ( $AB_3$ )

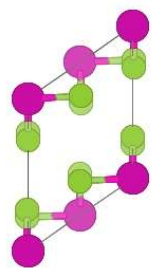


# $MoCl_3$ ( $AB_3$ )

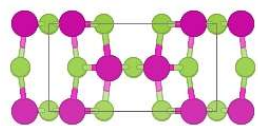
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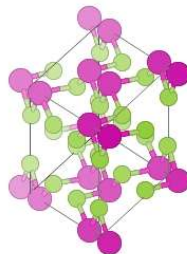
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$[010]$

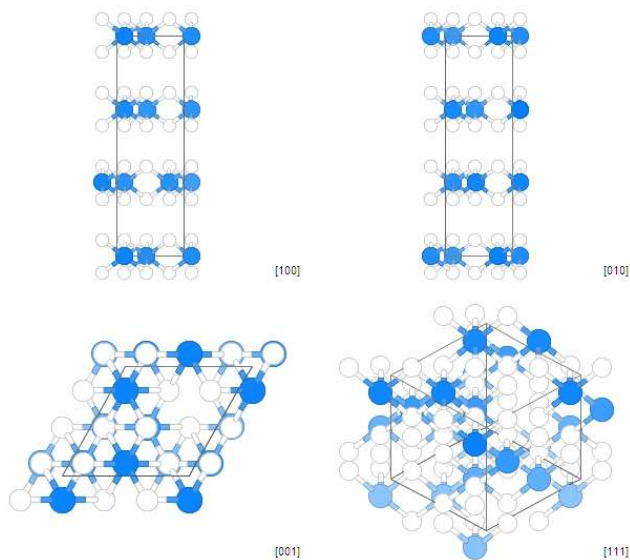
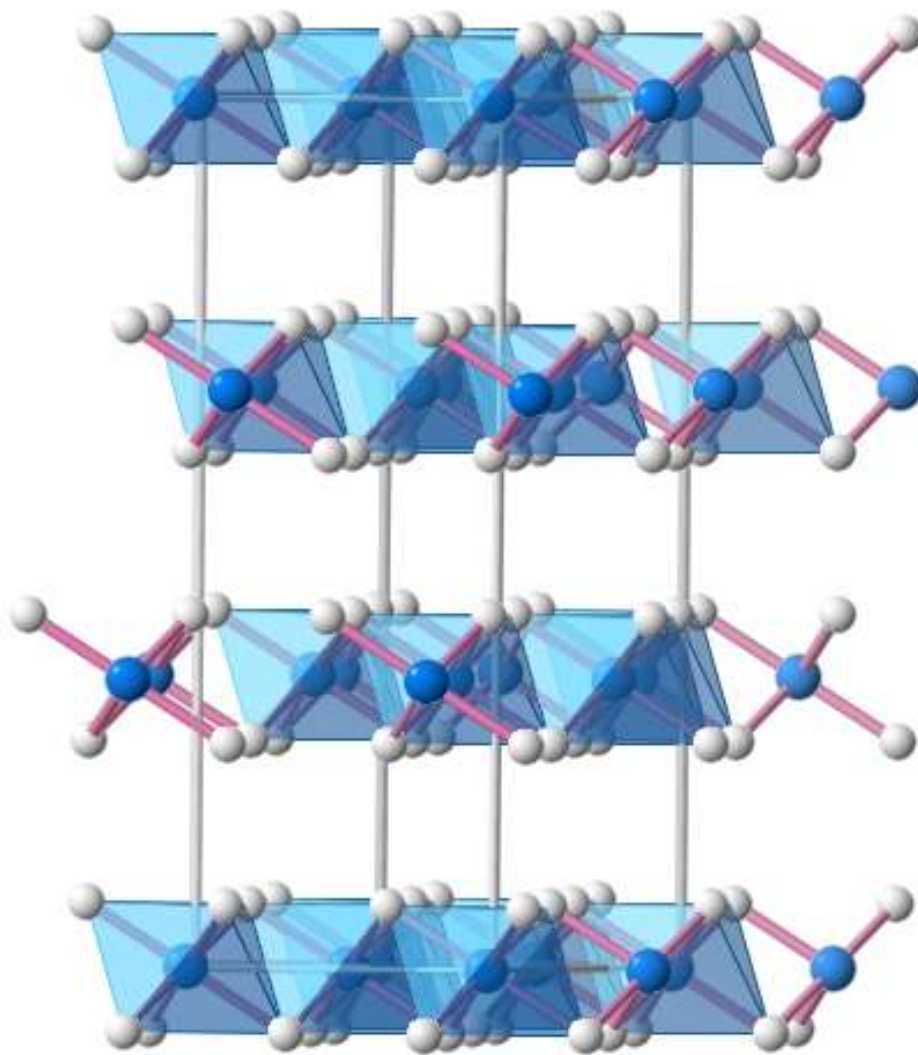


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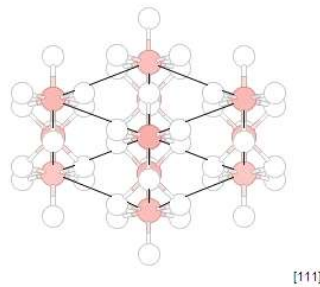
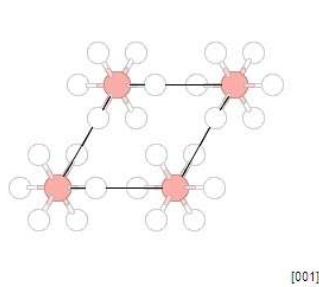
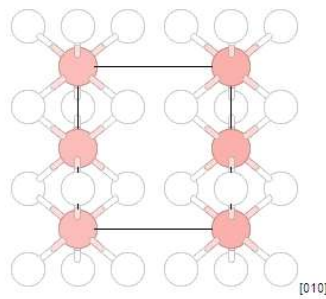
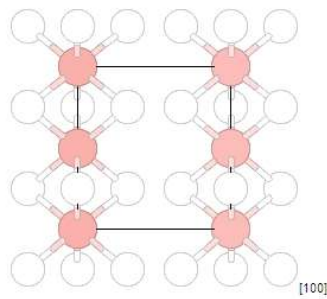
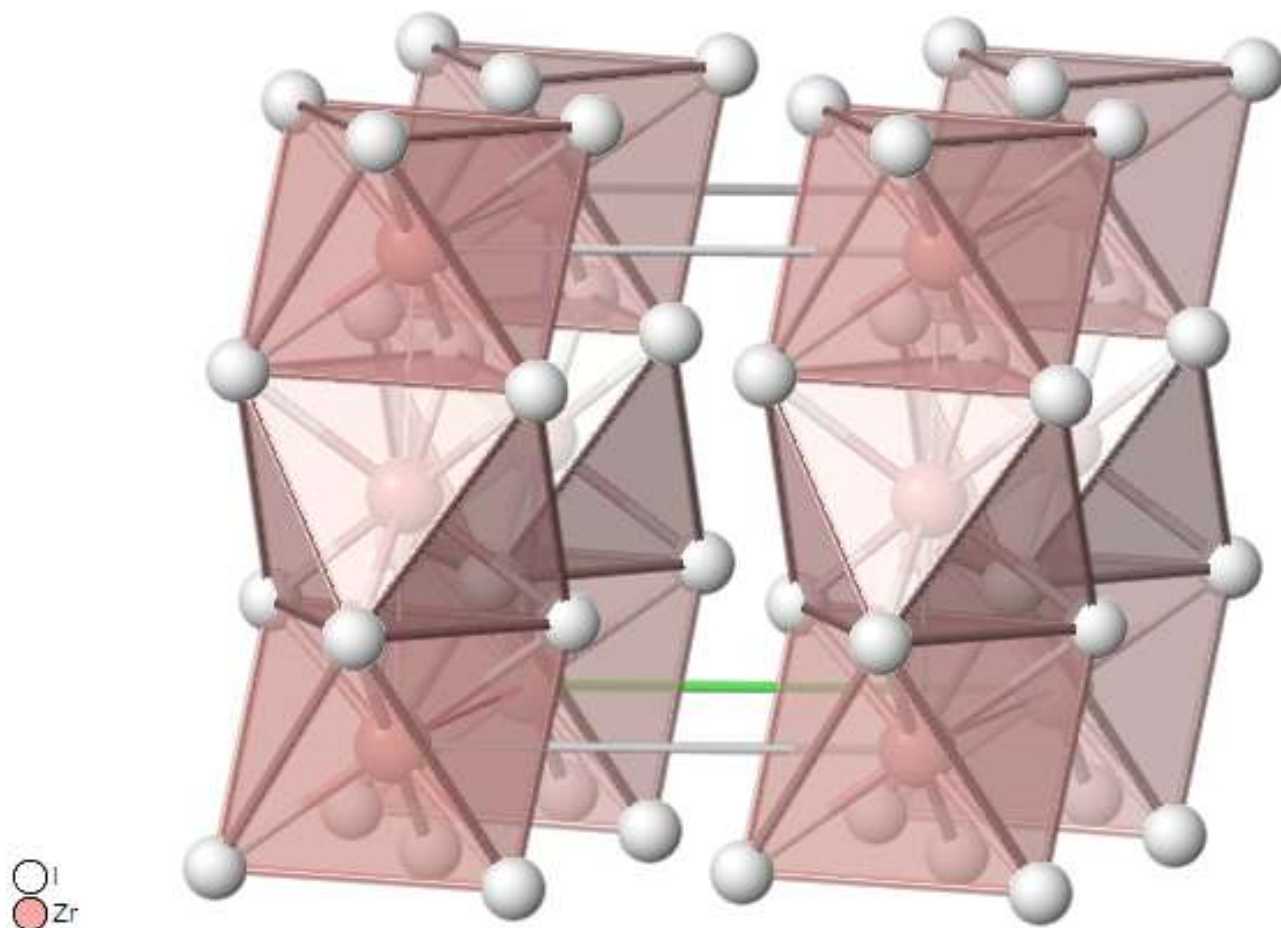


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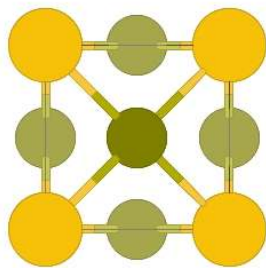
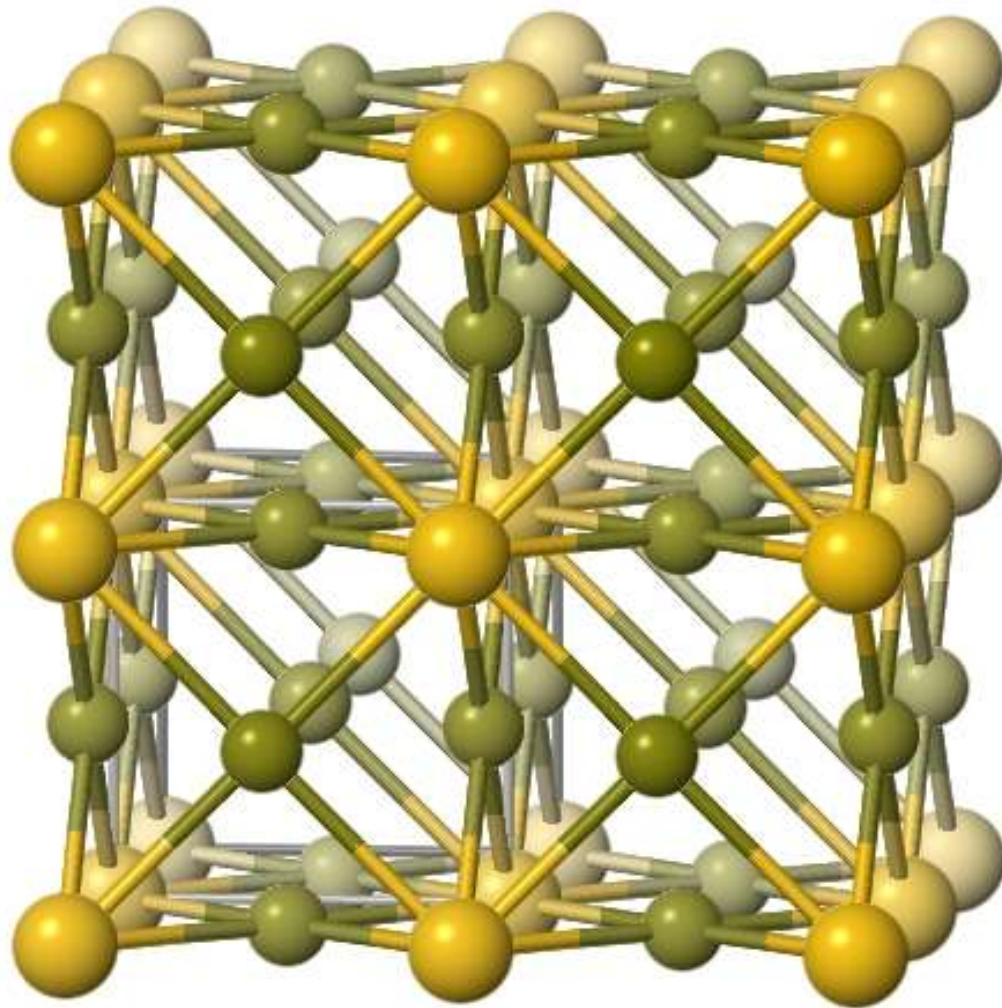
# $CrCl_3$ ( $AB_3$ )



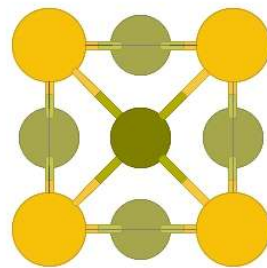
# $ZrI_3$ ( $AB_3$ )



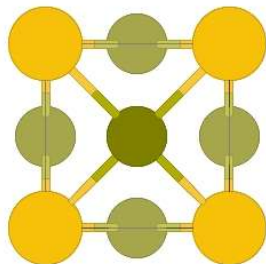
# $Cu_3Au$ ( $AB_3$ )



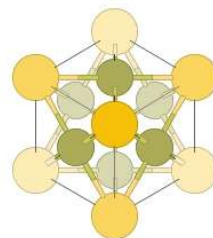
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$[010]$



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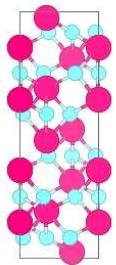
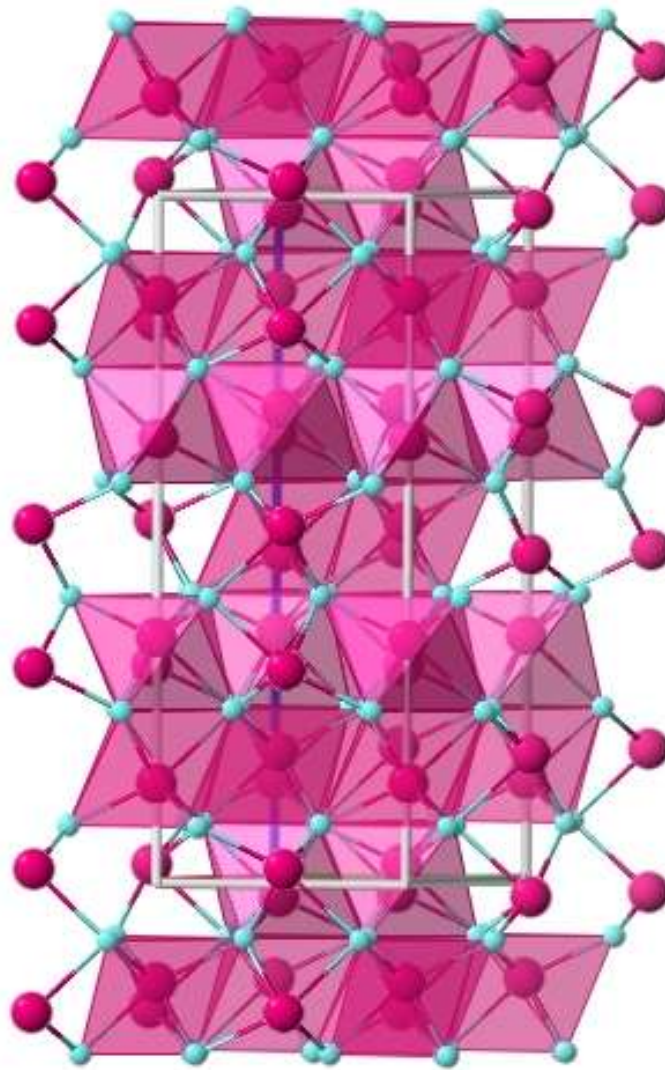


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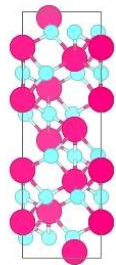


# $Al_2O_3$ ( $A_2B_3$ , Corundum)

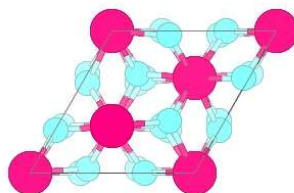
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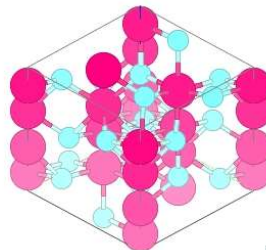
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$[010]$



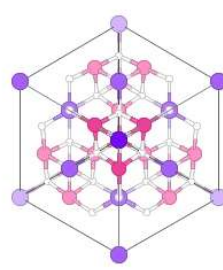
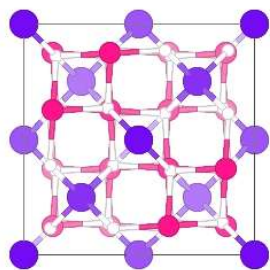
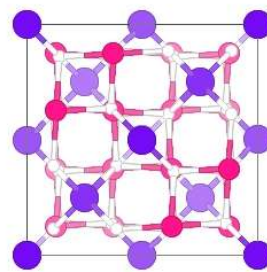
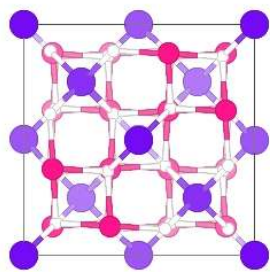
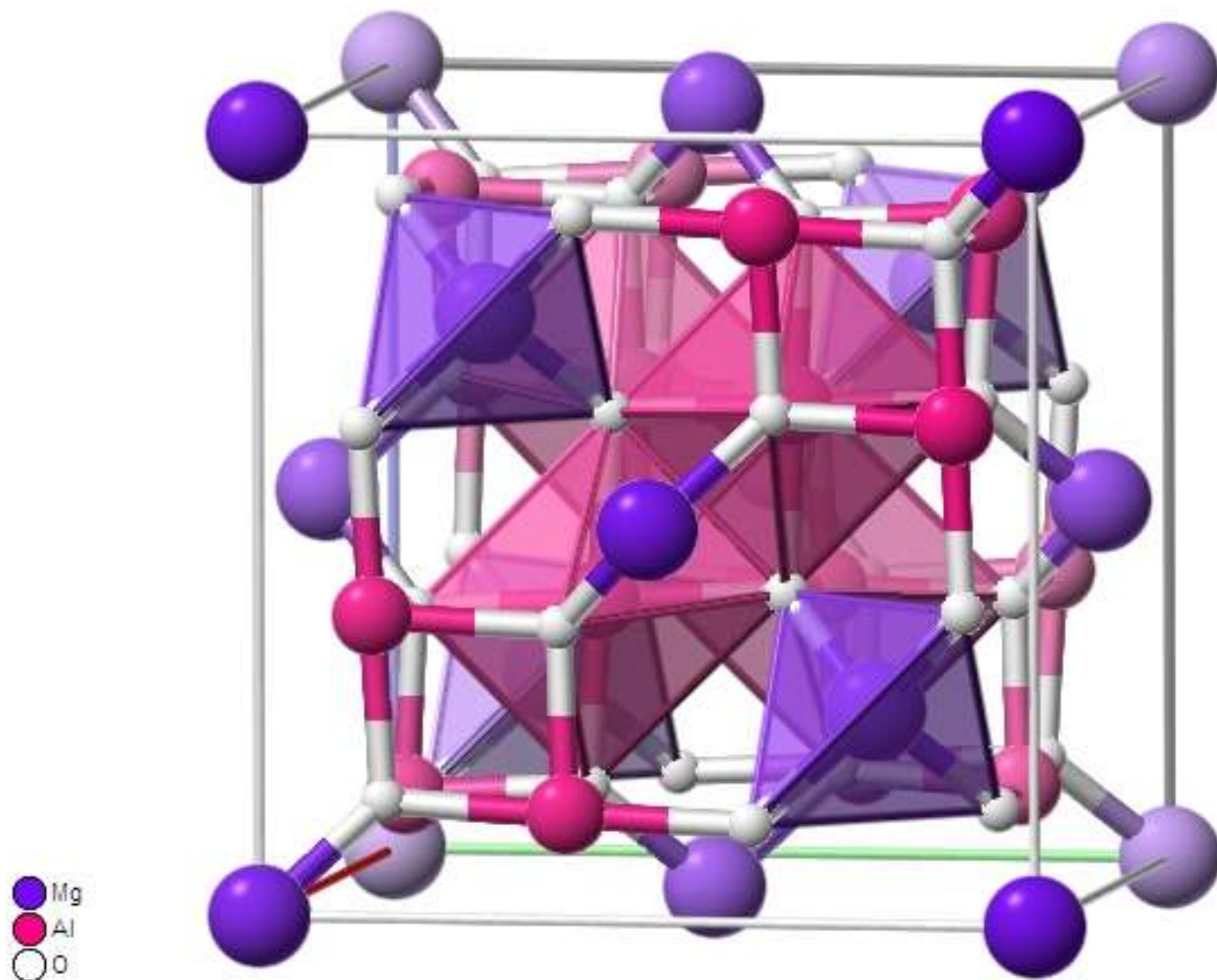
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$[111]$

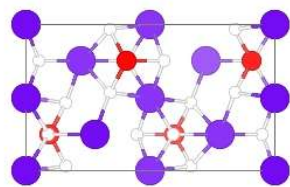
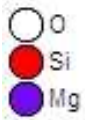
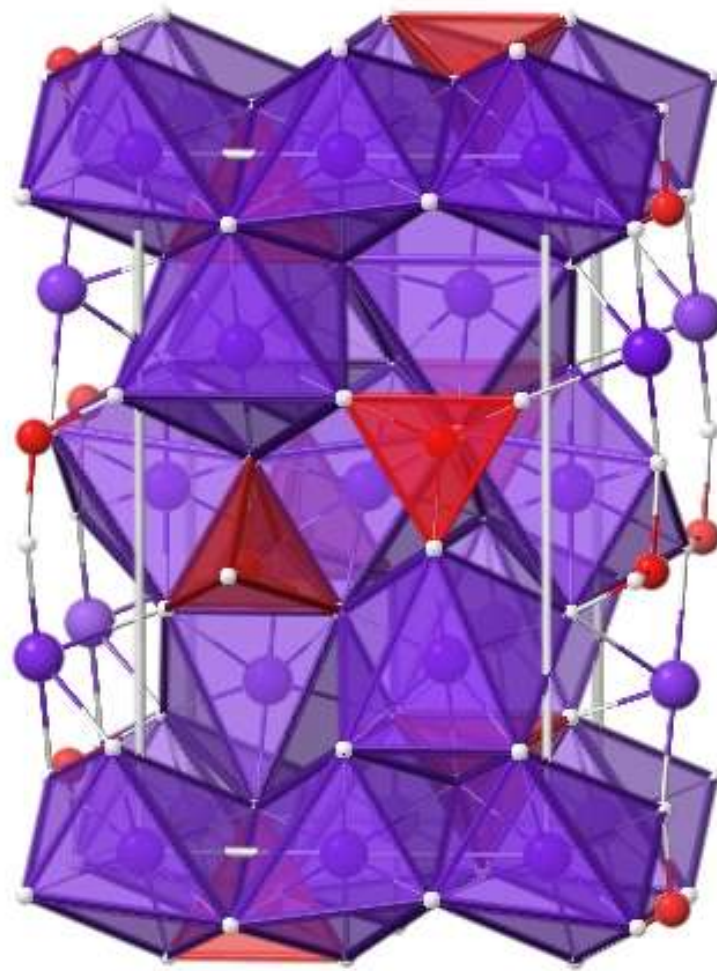
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# $MgAl_2O_4$ ( $A_3B_4$ , Spinel)

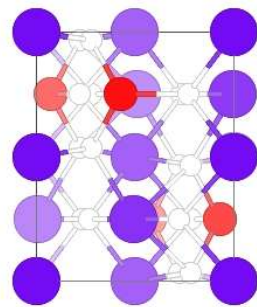


# *Olivine* (Others, $Mg_2SiO_4$ )

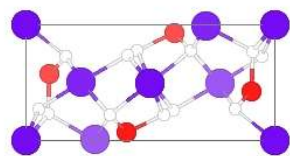
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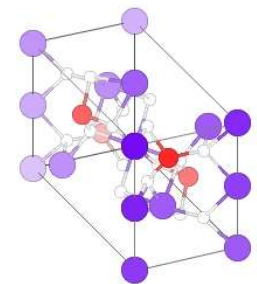
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[010]



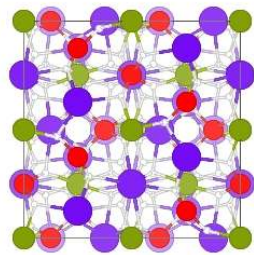
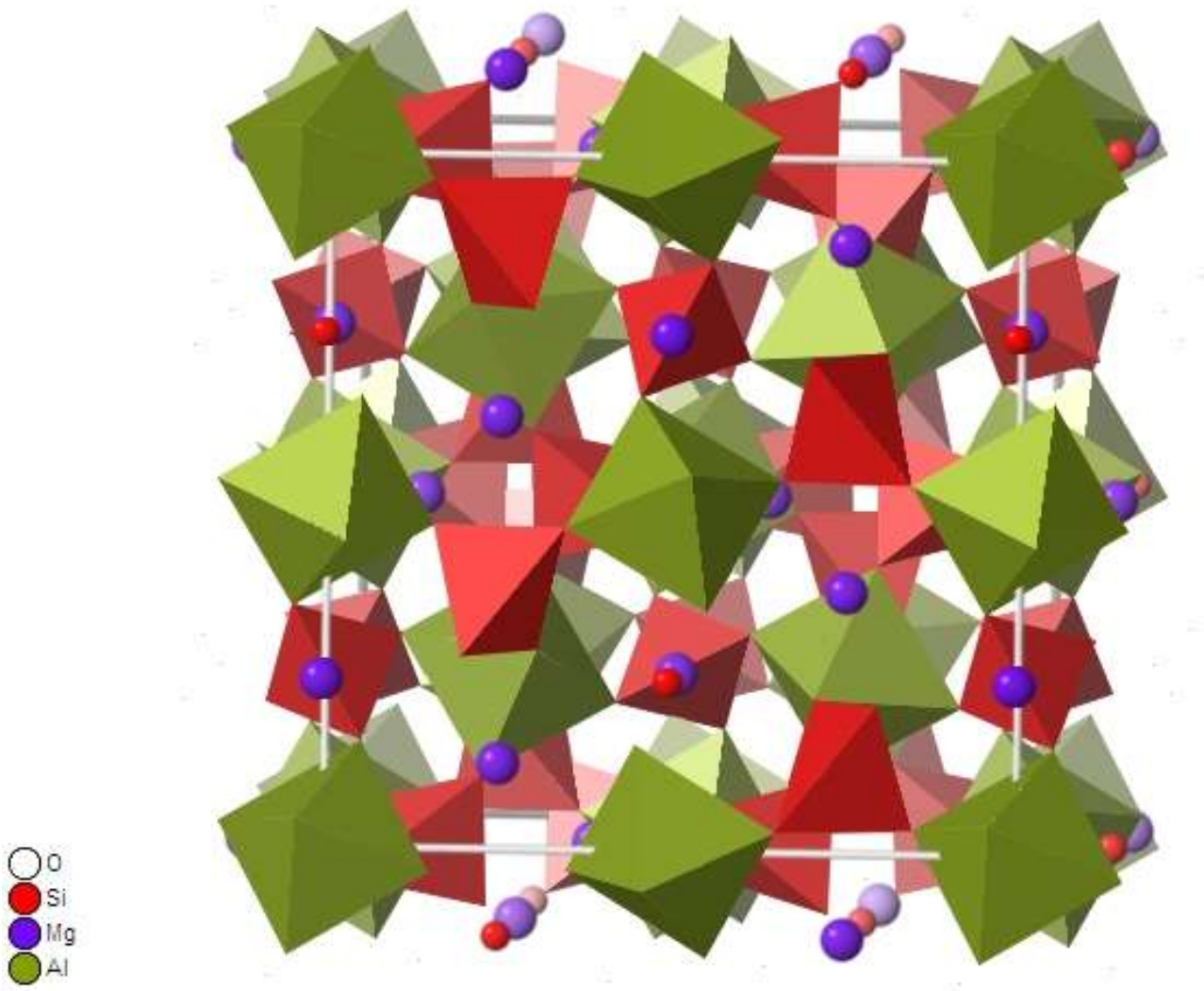
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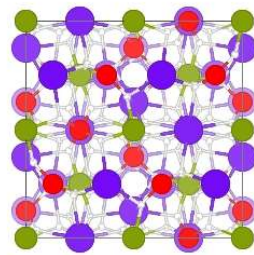
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# *Granate* (Others, Pyrope $Mg_3Al_2Si_3O_{12}$ )

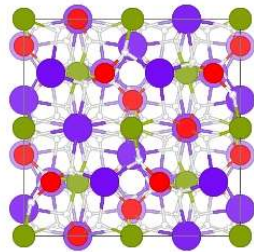
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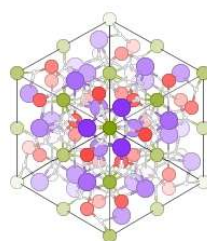
[100]



[010]

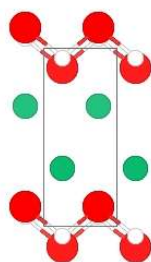
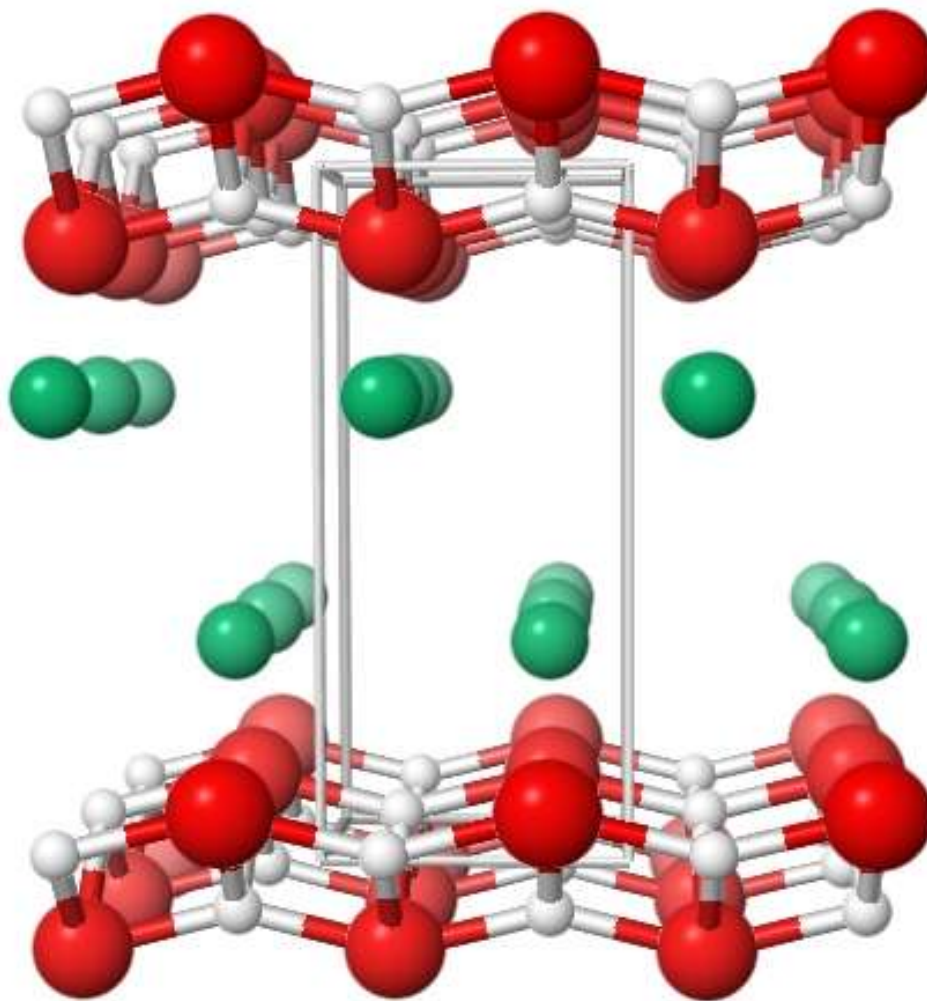


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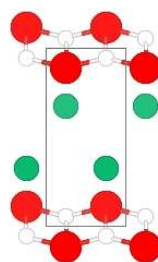


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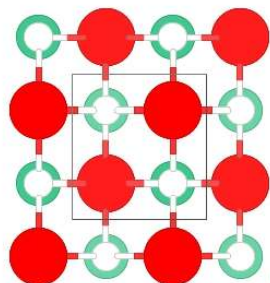
# *TiOBr* (Others)



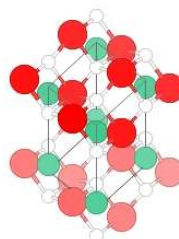
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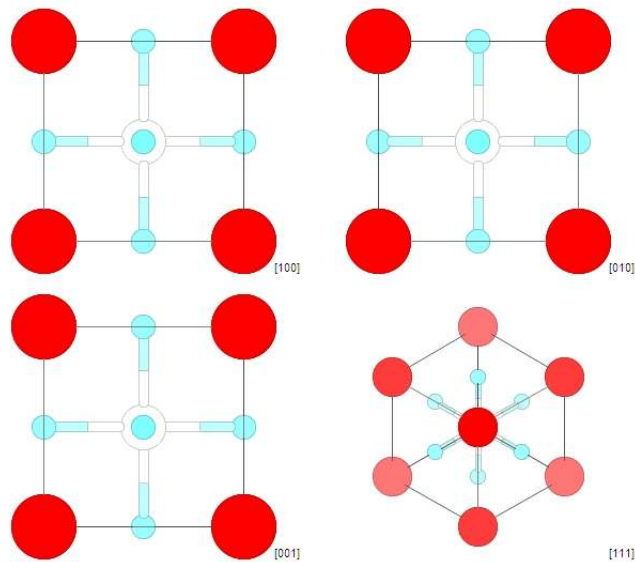
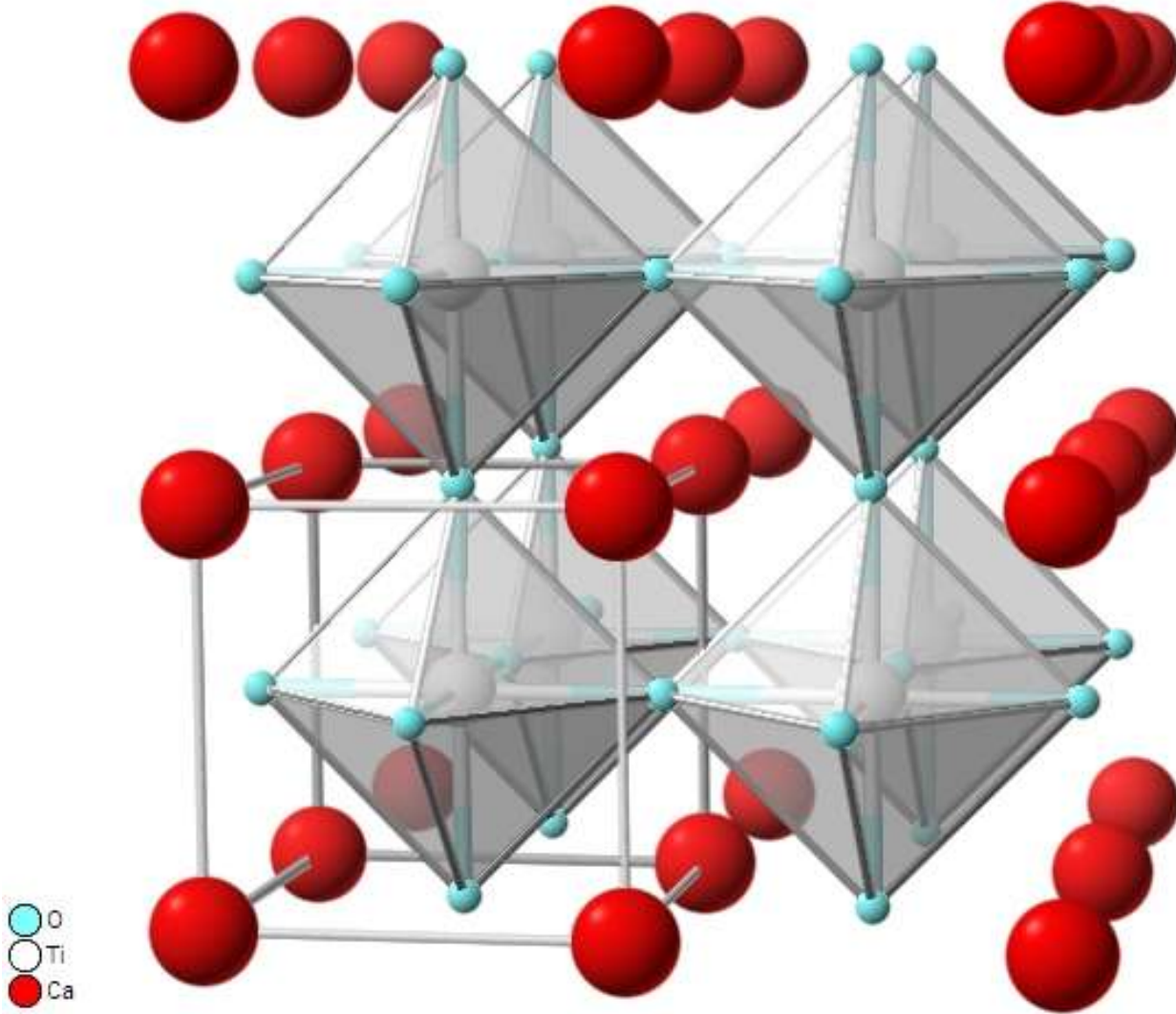


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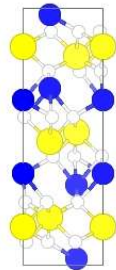
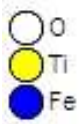
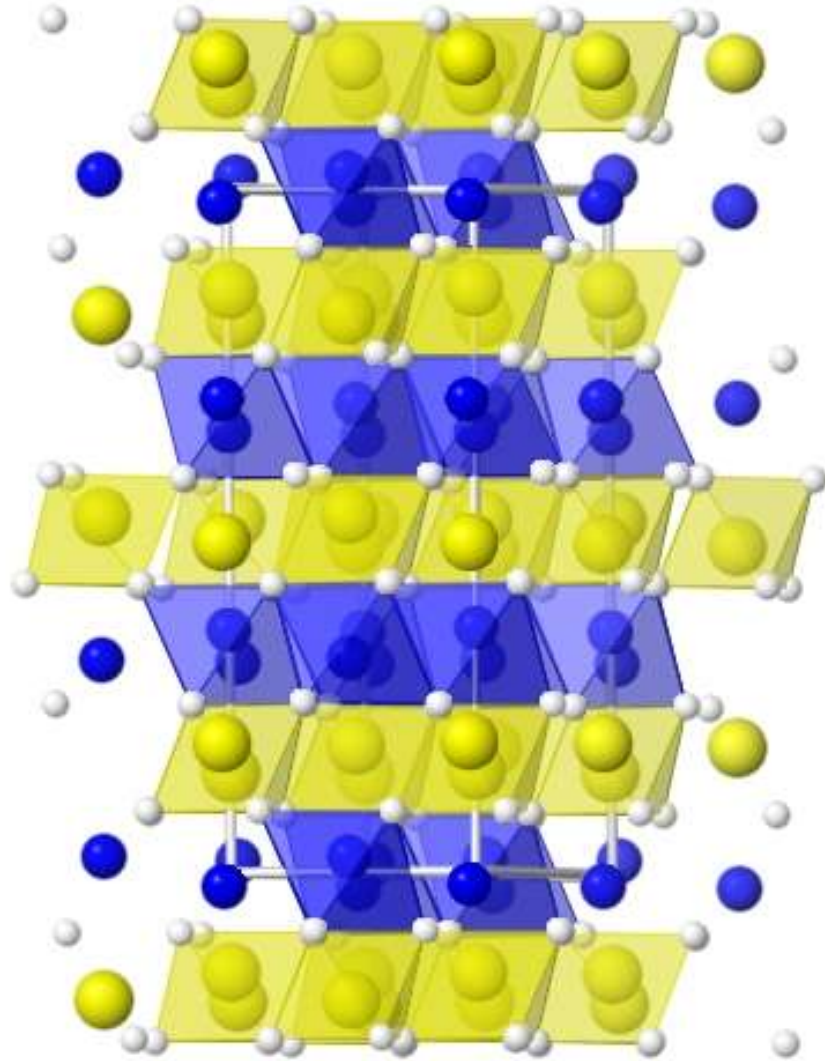


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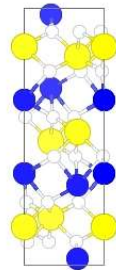
# Perovskite (*Others, CaTiO<sub>3</sub>*)



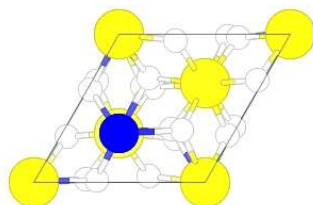
# *Ilmenite* (Others, $FeTiO_3$ )



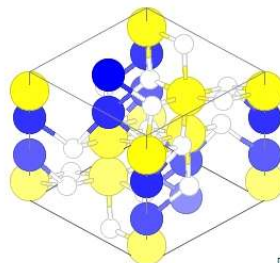
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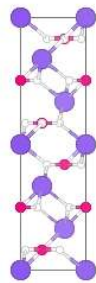
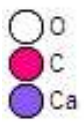
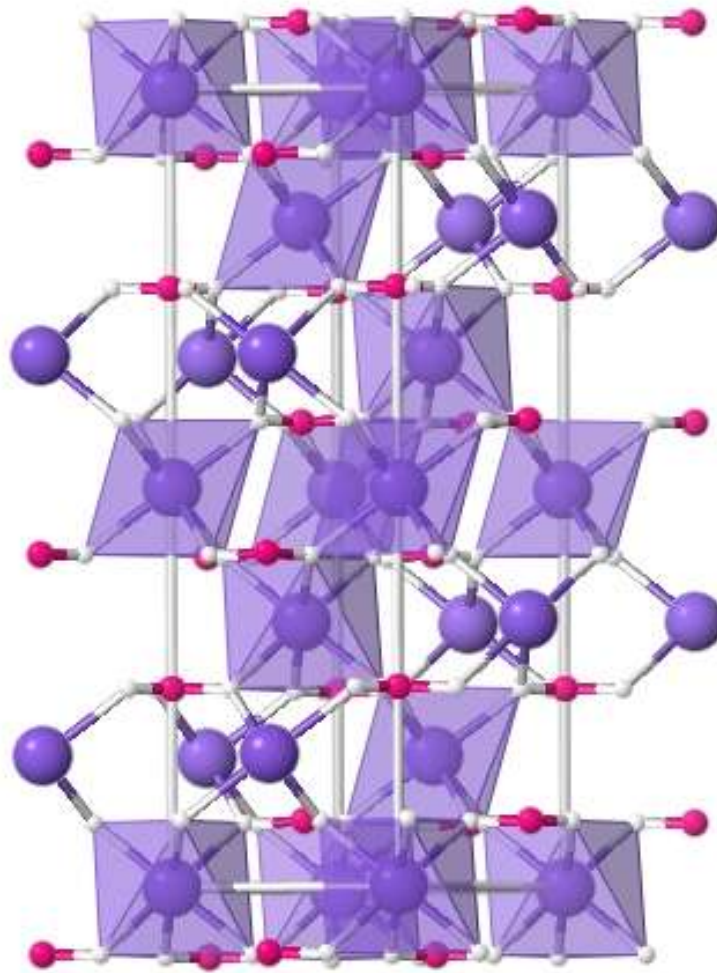
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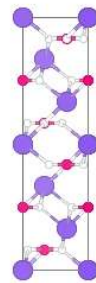
[111]

# Calcite (Others, $\text{CaCO}_3$ )

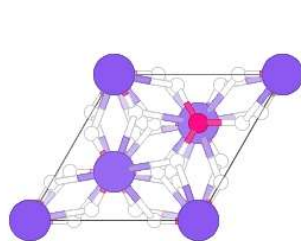
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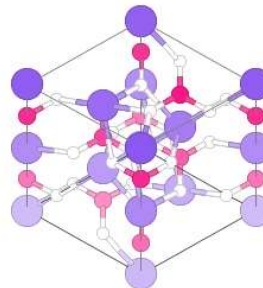
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[010]



[001]

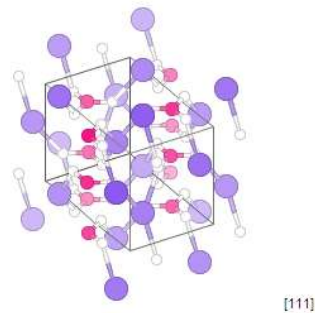
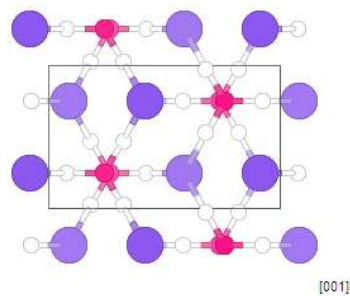
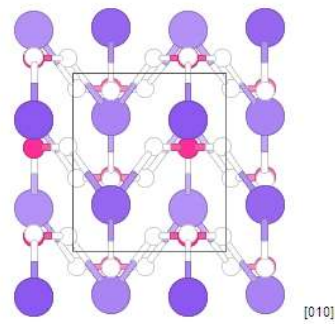
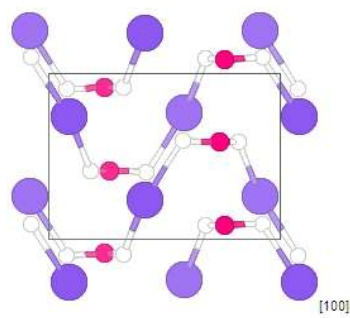
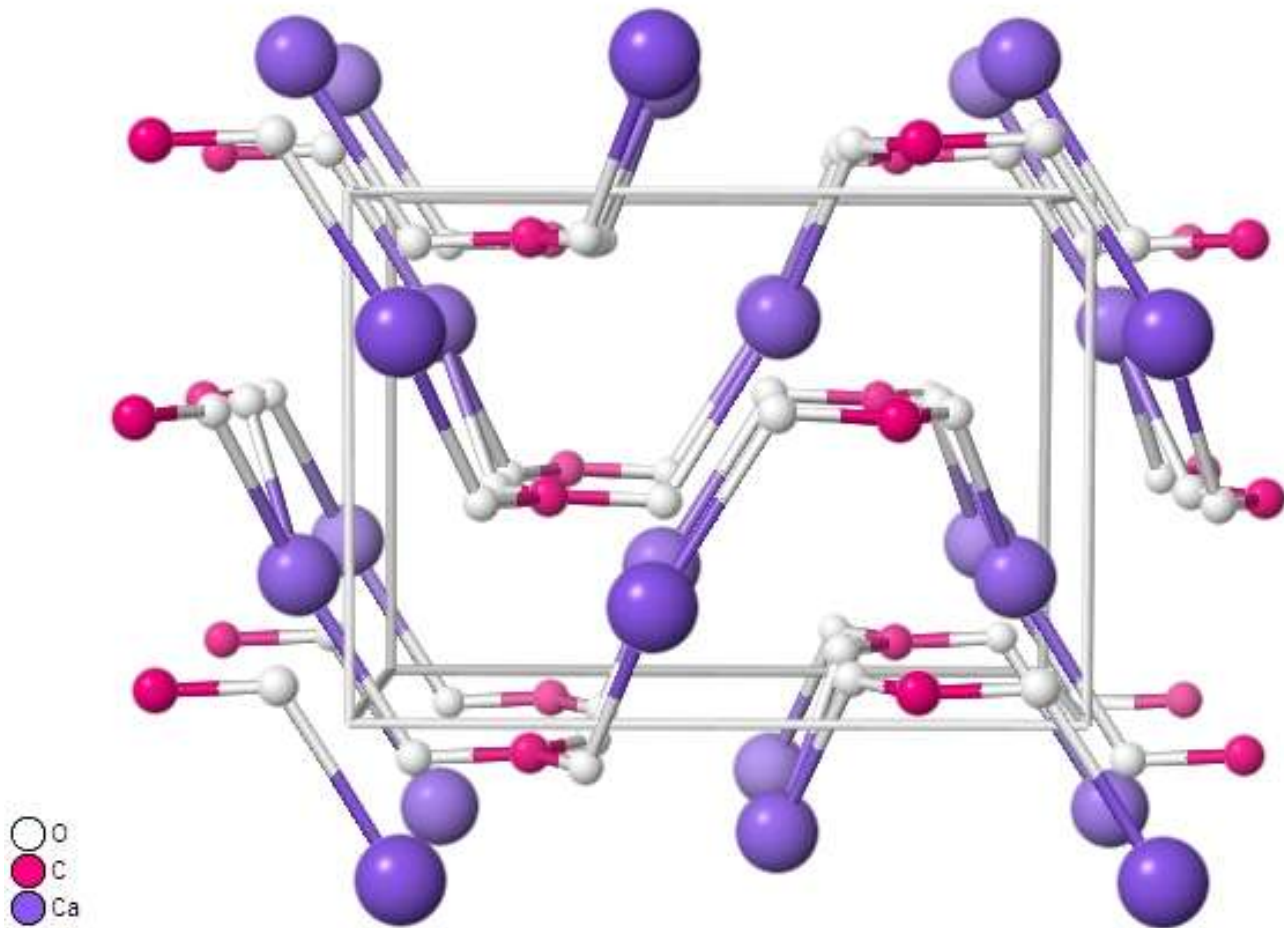


[111]



# *Aragonite* (Others, $\text{CaCO}_3$ )

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# *Disclaimer*

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If you think you found mistakes in any of the images displayed in this volume please let me know so I can fix them. Please feel also free to contact me with suggestions for improvements and additions to these picture books.

You may contact me via email at: *[jcrystalsoft@gmail.com](mailto:jcrystalsoft@gmail.com)*

- This Volume Ends Here -

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