

Table 1. The names and chemical compositions of minerals produced by biologically induced and controlled mineralization processes

<i>Name</i>	<i>Formula</i>
<u>Carbonates</u>	
Calcite	CaCO ₃
Mg-calcite	(Mg _x Ca _{1-x})CO ₃
Aragonite	CaCO ₃
Vaterite	CaCO ₃
Monohydrocalcite	CaCO ₃ ·H ₂ O
Protodolomite	CaMg(CO ₃) ₂
Hydrocerussite	Pb ₃ (CO ₃) ₂ (OH) ₂
Amorphous Calcium Carbonate (at least 5 forms)	CaCO ₃ ·H ₂ O or CaCO ₃
<u>Phosphates</u>	
Octacalcium phosphate	Ca ₈ H ₂ (PO ₄) ₆
Brushite	CaHPO ₄ ·2H ₂ O
Francolite	Ca ₁₀ (PO ₄) ₆ F ₂
Carbonated-hydroxylapatite (dahllite)	Ca ₅ (PO ₄ ,CO ₃) ₃ (OH)
Whitlockite	Ca ₁₈ H ₂ (Mg,Fe) ₂ ⁺² (PO ₄) ₁₄
Struvite	Mg(NH ₄)(PO ₄) ₂ ·6H ₂ O
Vivianite	Fe ₃ ⁺² (PO ₄) ₂ ·8H ₂ O
Amorphous Calcium Phosphate (at least 6 forms)	variable
Amorphous Calcium Pyrophosphate	Ca ₂ P ₂ O ₇ ·2H ₂ O
<u>Sulfates</u>	
Gypsum	CaSO ₄ ·2H ₂ O
Barite	BaSO ₄
Celestite	SrSO ₄
Jarosite	KFe ₃ ⁺³ (SO ₄) ₂ (OH) ₆
<u>Sulfides</u>	
Pyrite	FeS ₂
Hydrotroilite	FeS·nH ₂ O
Sphalerite	ZnS
Wurtzite	ZnS
Galena	PbS
Greigite	Fe ₃ S ₄
Mackinawite	(Fe,Ni) ₉ S ₈
Amorphous Pyrrhotite	Fe _{1-x} S (x = 0–0.17)
Acanthite	Ag ₂ S
<u>Arsenates</u>	
Orpiment	As ₂ S ₃
<u>Hydrated Silica</u>	
Amorphous Silica	SiO ₂ ·nH ₂ O
<u>Chlorides</u>	
Atacamite	Cu ₂ Cl(OH) ₃
<u>Fluorides</u>	
Fluorite	CaF ₂
Hieratite	K ₂ SiF ₆
<u>Metals</u>	
Sulfur	S

Table 1 continued.

<i>Name</i>	<i>Formula</i>
<u>Oxides</u>	
Magnetite	Fe ₃ O ₄
Amorphous Ilmenite	Fe ⁺² TiO ₃
Amorphous Iron Oxide	Fe ₂ O ₃
Amorphous Manganese Oxide	Mn ₃ O ₄
<u>Hydroxides & Hydrated Oxides</u>	
Goethite	α-FeOOH
Lepidocrocite	γ-FeOOH
Ferrihydrite	5Fe ₂ O ₃ ·9H ₂ O
Todorokite	(Mn ⁺² CaMg)Mn ₃ ⁺⁴ O ₇ ·H ₂ O
Birnessite	Na ₄ Mn ₁₄ O ₂₇ ·9H ₂ O
<u>Organic Crystals*</u>	
Earlandite	Ca ₃ (C ₆ H ₅ O ₂) ₂ ·4H ₂ O
Whewellite	CaC ₂ O ₄ ·H ₂ O
Weddelite	CaC ₂ O ₄ ·(2+X)H ₂ O (X<0.5)
Glushinskite	MgC ₂ O ₄ ·4H ₂ O
Manganese Oxalate (unnamed)	Mn ₂ C ₂ O ₄ ·2H ₂ O
Sodium urate	C ₅ H ₃ N ₄ NaO ₃
Uric Acid	C ₅ H ₄ N ₄ O ₃
Ca tartrate	C ₄ H ₄ CaO ₆
Ca malate	C ₄ H ₄ CaO ₅
Paraffin Hydrocarbon	
Guanine	C ₅ H ₃ (NH ₂)N ₄ O

* by the convention of Lowenstam & Weiner (1989)

References: Lowenstam & Weiner (1989), Simkiss & Wilbur (1989), Mann (2001), Weiner and Addadi (2002)

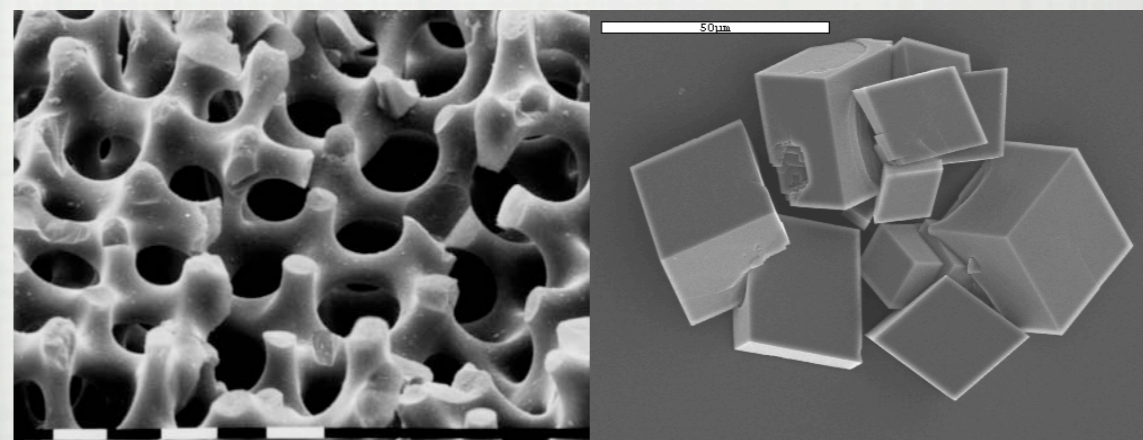


Figure 1. Comparison of calcite single crystals: (left) stereom of echinoderm and (right) synthetically produced rhombohedral forms.