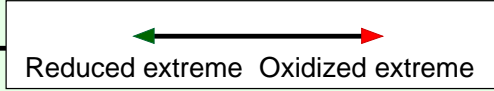


A table of systematic mineralogy III: redox pairs

Minerals consisting of uncharged atoms (i.e., in elemental state)	Minerals consisting of cations bonded to single anions (no radical groups or complex ions)	Minerals consisting of cations bonded to negatively-charged radical groups (i.e., to complex ions like CO_3^{2-} or AsS_3^{2-})					
Native elements Sulfur (S) Diamond (C) Copper (Cu)	Fluorides Fluorite (CaF_2)	Fluosalts:	Fluoborates Fluosilicates	Ferruccite ($NaBF_4$) Hieratite (K_2SiF_6)	Negative charge in mineral comes from halide anions		
	Halides ("Group VII -ides") (and thus minerals with 1- anions)	Chlorides Halite ($NaCl$)	Indifferent minerals				
	Bromides Bromargyrite ($AgBr$)	Iodides Iodargyrite (AgI)					
Oxides Hematite (Fe_2O_3) Oxidized minerals	Oxysalts:	Silicates Borates Carbonates Nitrates Phosphates Sulfates			Vanadates Chromates Niobates Molybdates Tantalates Tungstates	Arsenates Selenates Antimonates Tellurates Iodates Calcite ($CaCO_3$)	Negative charge in mineral comes from anions of Group VI elements
"Group VI -ides" (and thus minerals with 2- anions)	Sulfides Galena (PbS)	Sulfosalts:	Sulfarsenates Sulfogermanates Sulfantimonates Sulfostannates	Sulfovanadates Sulfarsenites Sulfantimonites Sulfobismuthites	Intermediate redox states Pyrargyrite (Ag_3SbS_3)		
Selenides Achavalite ($FeSe$)	Tellurides Altaite ($PbTe$)	Selenosalts:	Selenioantimonates Selenobismuthites	Permingeatite (Cu_3SbSe_4)	Intermediate-reduced redox states		
"Group V -ides" (and thus minerals with 3- anions)	Nitrides Osbornite (TiN)	Tellurisalts:	Telluribismuthites	Volynskite ($AgBiTe_2$)	Intermediate-reduced redox states		
Phosphides Barringerite (Fe,Ni_2P)	Arsenides Löllingite ($FeAs_2$)			Telluribismuthites	Telluribismuthites	Volynskite ($AgBiTe_2$)	Intermediate-reduced redox states
Antimonides & Bismuthides Sobolevskite ($PdBi$)	Carbides Moissanite (SiC)			Maximally reduced minerals	Telluribismuthites	Volynskite ($AgBiTe_2$)	Intermediate-reduced redox states
"Group IV -ides" (and thus minerals with 4- anions)	Silicides Guepéite (Fe_3Si)	Carbides Moissanite (SiC)	Silicides Guepéite (Fe_3Si)	Volynskite ($AgBiTe_2$)	Intermediate-reduced redox states		



This table focuses only on the redox state of the anions in minerals. Some minerals have cations whose redox state is the opposite that of the anion (e.g., ferroxahydrate $Fe^{2+}O_46H_2O$, griegite $Fe^{2+}Fe^{3+}S_4^{2-}$ and gwihabaite $(NH_4^{3+}K^{5+})O_3$).