

The Health Impacts of Uncontrolled Coal Fires

Bob Finkelman
bobf@utdallas.edu

Ty Asha Nichols
naomi.plummer@utdallas.edu



Jharia Coalfield, India



Witbank Coalfield – South Africa



Open Cast Mine Fire, Northern China



Anthracite Region, U.S.A.

Toxic Gas Components

Typical Gas analyses reveals the presence of numerous compounds that are potential health hazards; many have no recorded toxicity in air.

Elements	Concentration (ppm)	US EPA Standards (ppm)
Benzene	6	0.03
Toluene	1	0.03
Xylene	1	-
CO ₂	6500	9
CO	24 000	35
CH ₄	50 000	-

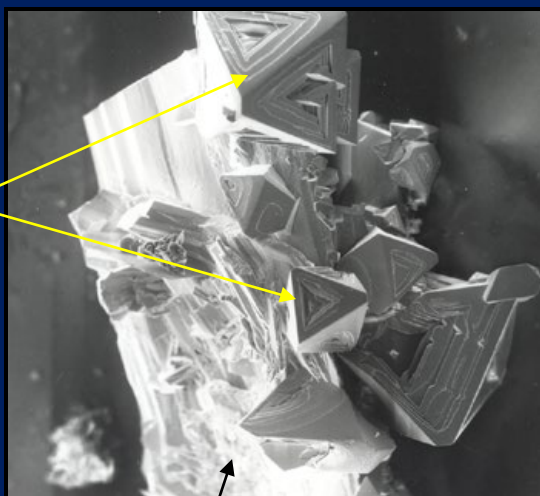
Orpiment
(As_2S_3)



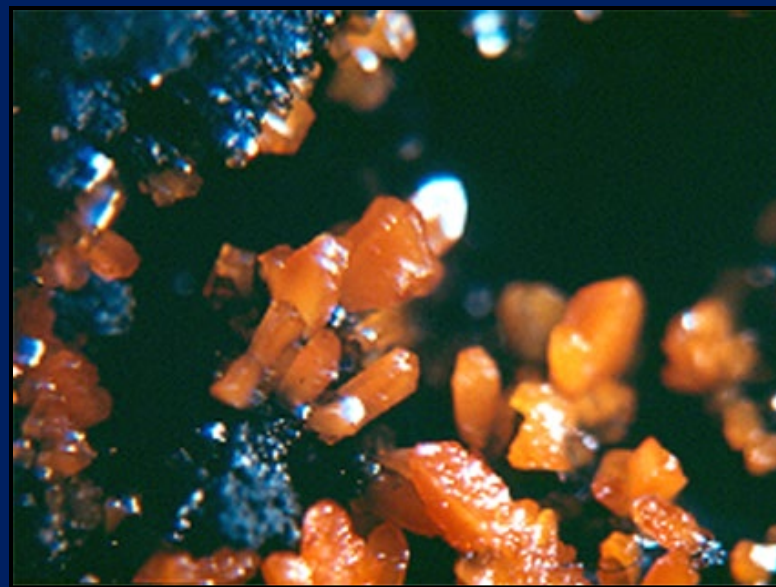
Amorphous arsenic



Arsenolite
(As_2O_3)



Laphamite (As_2Se_3)



Realgar (AsS)

Laphamite (As_2Se_3) Arsenolite (As_2O_3)



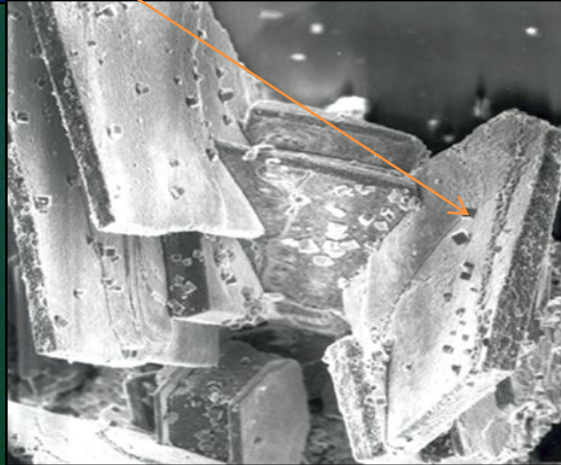
Downeyite (SeO_2)



Elemental selenium

KAlF_4

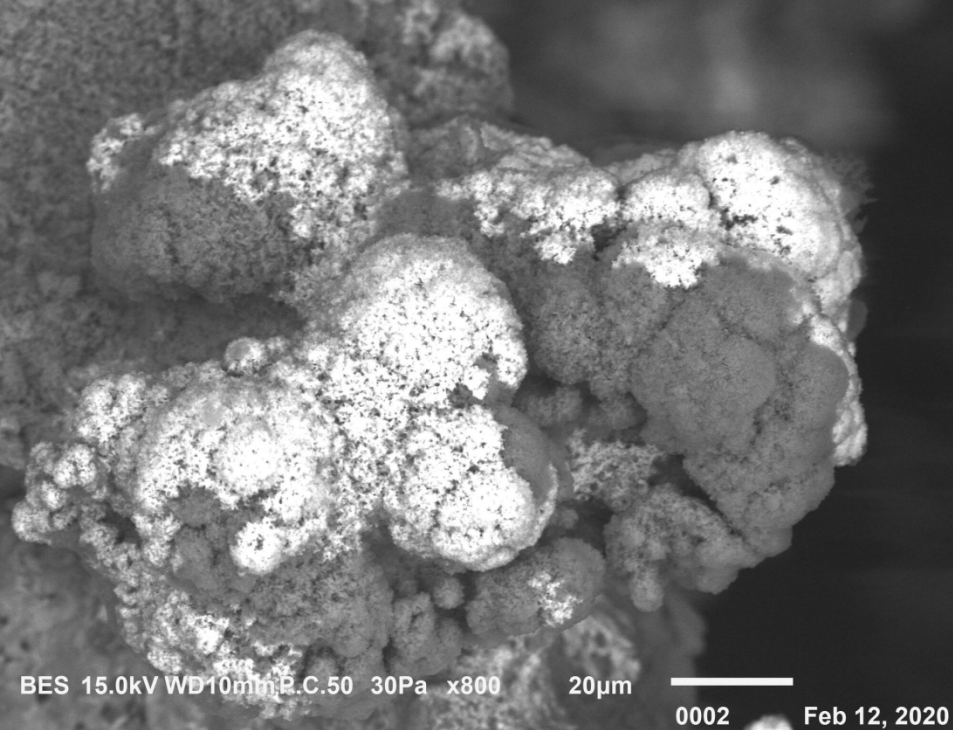
Galena (PbS) on Berndtite (SnS_2)



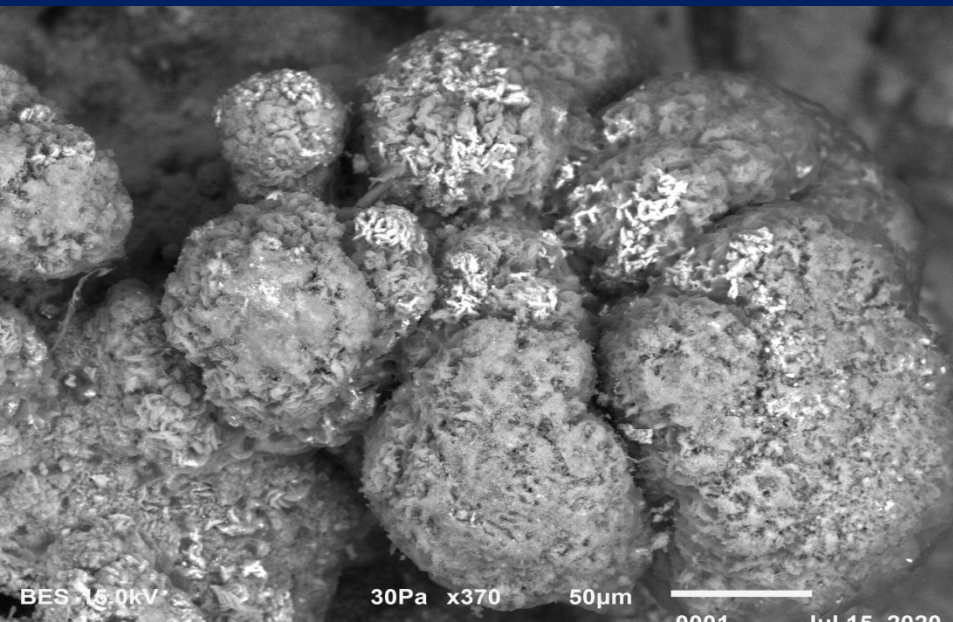








Unknown iodine mineral on cryptohalite/bararite [$(\text{NH}_4)_2\text{SiF}_6$]



Fluorine concentration in mg/kg – Max. (average)

	Bastacola	Levripathra	Lodhna
Coal	622 (480)	442	-----
Condensates	615 (462)	380,000! (65,000)	559 (339)
Plants - Roots	337 (285)	2560 (1111)	182
Plants - Shoots	449 (263)	1940 (1023)	298
Plants - Leaf	481 (345)	7093 (3003)	457
Soil	415 (373)	328	-----
Water	-----	134	150

Typical concentrations: coal 100 ppm; leaf 5-30 ppm; soil 300-400 ppm; fresh water less than 1 ppm.

Jharia, India



“The fire like a hungry demon would devour all of us, and pollution would only hasten the diminishing process.”

