Electronic Supplementary Material (ESI) for Journal of Analytical Atomic Spectrometry.

Supplementary information

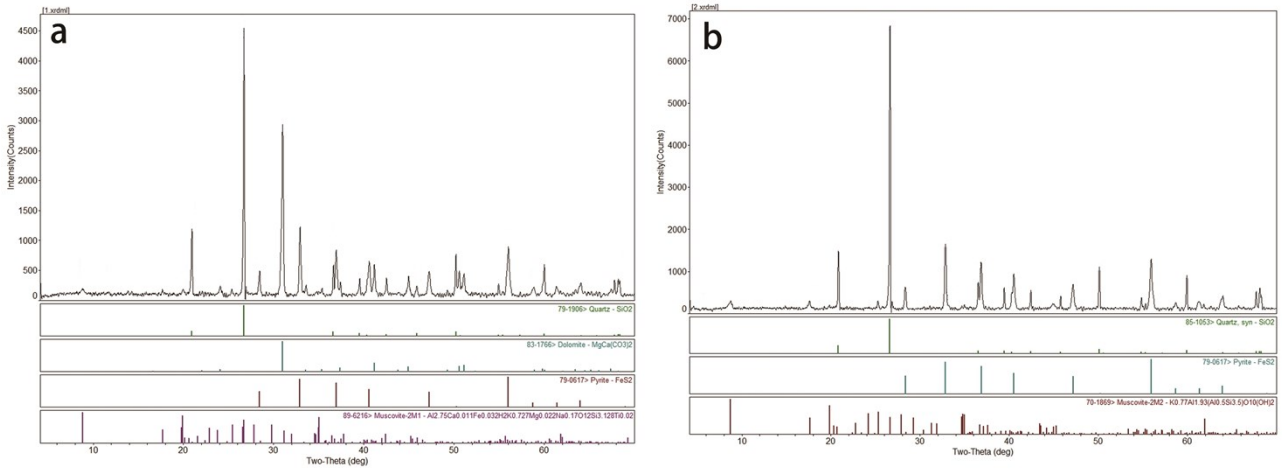

Fig. S1 XRD diagrams of Py0 (a) and Py1 (b).

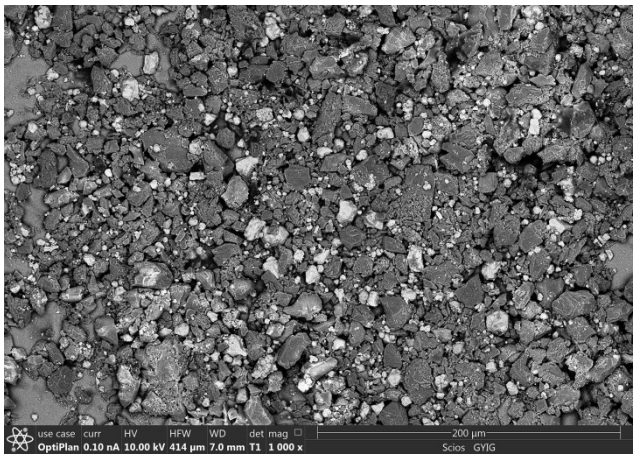

Fig. S2 Backscattered electron (BSE) image of Py0 with the brighter particles indicating pyrite and the rest being the matrix minerals.

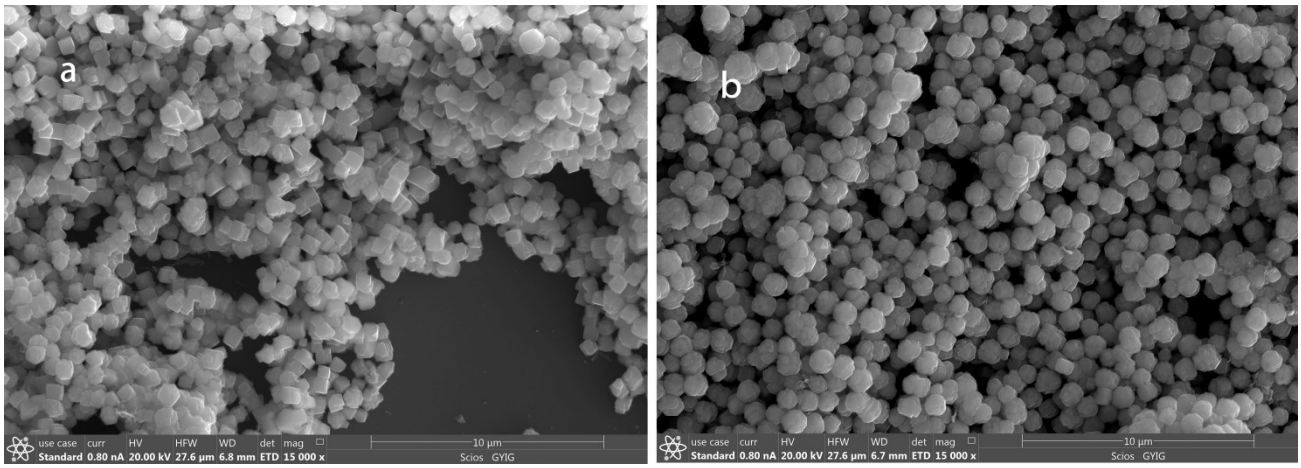

Fig. S3 SEM images of synthetic pyrite (a) and arsenian pyrite (b) with an As content of ~2.3 wt. %.

Table S1 XRF results of Py0 and Py1.

	Py0 (wt. %)	Py1 (wt. %)
SiO_2	34.49	54.73
Al_2O_3	5.94	8.27
Fe	11.73	13.70
MgO	7.10	0.17
CaO	13.61	0.04
Na_2O	0.12	0.14
K_2O	0.94	1.37
TiO_2	0.73	1.05
MnO	0.30	
P_2O_5	0.26	0.09
Cr_2O_3	0.11	0.03
S	10.83	18.55
As	1.19	1.58

Note: the percentage mass of arsenian pyrite (see 3.1) is estimated by adding up the Fe, As contents from XRF data, and the calculated S content based on the pyrite formula ($FeAs_xS_{2-x}$).

Table S2 Dissolved Fe and As concentrations in the acid etching solutions for synthetic pyrite ($P_{0\text{-}et(aq)}$~$P_{4\text{-}et(aq)}$) and arsenian pyrite ($AP_{0\text{-}et(aq)}$~$AP_{4\text{-}et(aq)}$) respectively.

Solution sample	Fe (ppm)	As (ppm)	Etched depth (nm)
$P_{0\text{-}et(aq)}$	35.75		2.51
$P_{1\text{-}et(aq)}$	7.78		0.61
$P_{2\text{-}et(aq)}$	7.96		0.57
$P_{3\text{-}et(aq)}$	6.31		0.44
$P_{4\text{-}et(aq)}$	7.51		0.53
$AP_{0\text{-}et(aq)}$	58.00	8.77	4.26
$AP_{1\text{-}et(aq)}$	9.70	0.76	0.71
$AP_{2\text{-}et(aq)}$	10.83	0.73	0.80
$AP_{3\text{-}et(aq)}$	10.34	0.66	0.76
$AP_{4\text{-}et(aq)}$	9.16	0.56	0.67