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Relationship between Hg and sulfur in coal from Huaibei coalfield, China

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Many authors have reported that Hg in coal can exist in solid solution within pyrite. Correlations between sulfur and Hg are often attributed to this mode of occurrence and are most common in coals that are extremely enriched in Hg.

The result of this study shows that coal samples from the Huaibei coalfield have relatively low sulfur values (average 0.59%). The correlation coefficient between ash and sulfur is -0.08, indicating that sulfur in the Huaibei coals has an intermediate (organic and inorganic) affinity. In a study of 29 coal samples from the Huaibei coalfield, We observed that organic sulfur is the dominant sulfur form when the total sulfur is near 0.5%. Some literatures report that organic sulfur compounds can capture Hg and result in the enrichment of Hg in coals.

The conclusion shows the relationship between Hg and sulfur in all 29 coal samples that we examined; note that the correlation coefficient is only 0.17 (n=29). Interestingly, and it shows a significant positive correlation between Hg and sulfur (n=21, R=0.64, $p<0.05$) is obtained by excluding the eight samples from the No. 5 and 7 coal seams, which were influenced by a magmatic intrusion. This suggests that the magmatic intrusion not only increased the concentration of Hg in seams 5 and 7, but also changed the mode of Hg occurrence in these seams. The significant, positive correlation between Hg and sulfur in coals from the No. 3, 4, and 10 seams suggests that Hg in these coal seams is bound to both organic sulfur moieties and within sulfide minerals.