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Interactive Comment

Interactive comment on "Sulfur-containing particles emitted by concealed sulfide ore deposits: an unknown source of sulfur-containing particles in the atmosphere" *by* J. Cao et al.

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There is earth degassing phenomena in metallic and nonmetallic deposits. The giant gold deposits, such as the Porcupine gold deposit in Canada, the Witwatersrand gold deposit in South Africa, and the Muruntau gold deposit in Uzbekistan, exhibit upward vertical movement of hydrocarbon gas. The Witwatersrand gold deposit has significant upward gas flow. In one day, 36700 m3 of hydrocarbon gases degas from underground gold mining vents and 5 $\times$ 108 m3 of hydrocarbon gases degas from 3000m or deeper mines every year. The Azerbaijan oil and gas region is strongly degassed, with 4 $\times$ 108 m3 of gases degassed every year (Du, 2009). The ascending gas flow rates were

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measured to be between 60 $\times$ 10−4 and 4 cm3 min−1 m−2 horizontally projected borehole area at three different sites by Malmqvist & Kristiansson (1984). Carbon dioxide concentrations above sulfide mineralizations are often enhanced. Hidden sulfide mineralizations at a depth of 200 m have been located in quartzite in areas such as Brittany, and sulphide ores have been located in granite in Cornwall. Above mineralizations, carbon dioxide in the soil gas has been found to increase to 10% from the normal concentration of 1%. The carbon dioxide flow may be as large as 0.2 l m−2 h−1 (Hermansson et al. 1991). The Dongshengmiao deposit lies in a seismically active zone. The Langshan Mountain-front fault, in which minor earthquake activity frequently takes place and where M=6 earthquakes have taken place three times in the twentieth century, passes through the deposit. The release of geogas in active tectonic areas is widespread and occurs at a significant level (Judd et al., 1997; Etiope, 1999; Mörner and Etiope, 2002). The CO_2 emission flux of the Siena Graben Faults (Italy), Siena G. Arbia Fault (Italy), Ustica Arso Fault (Italy), and San Andreas Fault (California) were 0.83–1123, 12.4–74.4, 77.3, and 0.4–23 kg m–2 year–1 respectively (Etiope, 1995; 1999; Mörner and Etiope, 2002; Lewicki and Brantley, 2000). These equate, respectively, to 0.02–26.94, 0.3–1.78, 1.85, and 0.01–0.55 cm3 m−2 s−1 if CO_2 density is assumed to be 1.3401 kg m-3. The area of the Dongshengmiao deposit is 4.65 km2. The emission flux estimation of the Dongshengmiao deposit was 0.5 cm3 m−2 s−1 according to the emission fluxes of the above-mentioned faults and deposits. Therefore, the estimated degassing rate for the Dongshengmiao deposit was 2.325 m3 s−1. According to the minor comments, the manuscript has been revised.

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