

## **Tectonic controls on the emission of CO<sub>2</sub> and CH<sub>4</sub> in the vicinity of the northwestern boundary of the Ordos Block, China**

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The CO<sub>2</sub> and CH<sub>4</sub> concentrations on the surface and at 1.5 m above the surface in different geological structures were measured in vicinity and the northwestern edge of Ordos Block, China, where was characterized by the complex tectonic structure and strong earthquakes. The of CH<sub>4</sub> and CO<sub>2</sub> concentrations measured varied from 1.905 to 2.472 ppm and 397.5 to 458.5 ppm, respectively. Most CO<sub>2</sub> and CH<sub>4</sub> concentrations were higher on the surface than those at 1.5 m height, indicating that the measured CH<sub>4</sub> and CO<sub>2</sub> concentrations had the contribution of underground gases. The CH<sub>4</sub> and CO<sub>2</sub> concentrations at the 1.5 m height showed the similar variation trends with that on the surface in the different tectonic settings in the study area. The spatial distributions of CH<sub>4</sub> and CO<sub>2</sub> had a close correlation with the tectonic settings and stress fields, indicating that gas source, pathway for gas migration and stress all played important roles in the CH<sub>4</sub> and CO<sub>2</sub> degassing. Among the factors affected the gas emission, stress was a complicate factor because it controlled the pathway of degassing except for driving the gas migration. The cracks can be created by the enhanced stress while they may be reduced and even blocked at some time of the stress enhanced. The results were helpful for understanding the mechanism of tectonic CH<sub>4</sub> and CO<sub>2</sub> degassing and tectonic seismic activity detection.