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Experimental Evidence on Formation of Imminent Hydrochemical Precursors for Earthquake

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This paper reported the effects of special surface area of rock exposed to water, water-rock interaction and reaction time on hydrochemical variations based on soaking experiments and discussed the formation of imminent and short-term hydrochemical precursors for earthquake.61 soaking experiments with granodiorite and trachyandesite grains of different sizes and three chemical types of waters were carried out for 6 to 168 h. The experimental solutions were chemically analyzed with DX-120 Ion Chromatography. Our data demonstrate that(1) interaction between water and rock can result in both measurable increase and decrease in ion concentrations, which is controlled by dissolution and secondary mineral precipitation as well as chemical types of rock and groundwater;(2) the extent of hydrochemical variation is direct proportion to the grain size, suggesting microfracture formation and water-rock reaction in brittle aquifer may be an important genetic mechanism of hydrochemical seismic precursors;(3) weight ratio of water versus rock may change the intensity of hydrochemical anomaly. The results can be used to explain the similar hydrochemical phenomena monitored in the field. Key words: Hydrochemistry, Water-rock interaction, Microfracture, Aquifer, Earthquake precursor.