

Use of passive sampling to measure organic chemicals and metabolites in water and soil: Application to human health risk assessment in developing countries

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Measuring chronic exposure to broad chemical mixtures at trace levels is currently not practical because traditional *grab* samples do not capture temporal variations in exposure and thus provide little information on chronic exposure unless many samples are collected and analyzed. This problem is even greater in developing countries where resources for sampling and chemical analysis can be extremely limited. We will report on the use of passive sampling devices (PSDs) to provide a cost-effective means of estimating chronic exposure and toxic response in water and soil. PSDs sequester and preconcentrate organic chemicals from water and from soil and sediment via desorption to water. Using laboratory-derived and field-verified uptake rates (calibration), PSDs were deployed in the field for a known amount of time (e.g., 1 month), the accumulated chemical residue was measured, and then the average exposure calculated based on the calibration. Extracts of the PSDs also were used in high throughput cell-based assays to measure various toxic endpoints such as genotoxicity and endocrine disruption. We will illustrate the potential utility of PSDs using data from the Red River, Vietnam. In surface waters, we found very good agreement between measured chemicals in the PSDs and synoptically deployed aquatic test organisms, providing strong evidence that PSDs accumulate only the bioavailable fraction of a chemical. In soil, we also found good agreement between PSDs and accumulation in earthworms. In both water and soil, there was generally good agreement between PSD chemical residues and toxic response variables. We will discuss the current utility and limitations for using PSDs for both human and ecological health risk assessments and provide an example of the spatial and temporal variation in human health risk to chemical exposure in the Red River, Vietnam.

Effect of hydrothermal alteration on magnetic susceptibility of Challu Pluton, SE Damghan- Iran

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Challu pluton located in the northern part of Central Iran structural zone, SE Damghan. Based on mineralogy and geochemistry, the pluton is I-type granite and compositionally ranges from monzodiorite and monzonite. The pluton intruded in Eocene volcano-plutonic series of Toroud-Chah Shirin. During the crystallization and cooling, a magmatic-dominated hydrothermal system caused extensive hydrothermal alteration and Fe mineralization.

Challu granitoidic body has been studied using by anisotropy of magnetic susceptibility (AMS). The method carried out by (MFK1-FA) Kappbridge susceptometer (AGICO, Brno) operating at low field (4×10^{-4} T; 920 Hz) at Geomagnetic Lab of Shahrood University of Technology. According to the measurements (32 stations, 96 cores and 384 fragments), the average magnetic susceptibility (K_m , in μSI) of monzonites and monzodiorites are 9323 and 28776, respectively. Therefore, the rocks belong to the ferromagnetic granitoids (bulk susceptibility $\geq 500 \mu SI$). Magnetite is the main carrier of the magnetic behavior and pyroxene, biotite and sphene are other carriers. Due to presence of extensive propylitic mineral assemblages (epidote, calcite and chlorite) in the south eastern margin and importance of their effect on AMS, the magnetic susceptibility of some grains of epidotes was determined. The obtained data shows that presence of this mineral has no effect on bulk susceptibility but the grain size of magnetic, its loss and damage during hydrothermal alteration reduced the amount of magnetic susceptibility.