Noble gases in the ureilites Kenna and RaS 247

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The high abundance of noble gases in ureilites in addition to their similar isotopic and elemental composition compared to primitive chondrites is one of the features that makes this type of differentiated meteorites interesting [1,2]. However, the exact origin of these gases, the nature of their host phase(s), and their relationship to phase 'Q' found in carbonaceous chondrites is still elusive. Here we present results of bulk measurements of Kenna and Ramlat as Sahmah 247 (RaS 247), a hot desert meteorite from Oman. Results of high precision measurements of acid residues from these meteorites will be available at the time of the meeting.

He and Ne noble gases in Kenna and RaS are dominantly cosmogenic (ca. 95% of the total Ne), whereas Ar is mostly primordial in composition. Despite weathering effects on Kenna and RaS 247, the air component in these samples is negligible. For RaS this is a rather unusual result since hot-desert meteorites tend to have high atmospheric ^{40}Ar abundances [3].

One-step pyrolysis and stepwise heating measured total gas concentrations in Kenna and RaS disagree beyond analytical uncertainty (~15%, up to a factor of 2, and ~50% for He, Ne, and Ar, respectively). Whether these variations are due to sample heterogeneity will be assessed by measuring different aliquots of Kenna sampled on a cm-scale. Stepwise heating experiments on both Kenna and RaS 247 reveal the presence of cosmogenic He and Ne at the lower temperature steps (600-800°C). If these gases are hosted in the same phase, then this phase cannot be carbonaceous, as suggested by [2] for the case of He, because the production of cosmogenic Ne requires a target in the mass range of Mg, Al, and/or Si (or heavier). However, a proper identification of the host(s) requires further tests.

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Bioamplification of methylmercury in two trophically dissimilar marine ecosystems

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Our recent data confirm that mercury concentrations in the muscle tissues of the European hake (*Merluccius merluccius*) caught in the North-Western Mediterranean Sea are significantly higher than those measured in the fish of the same species caught in the North-Eastern Atlantic (see figure). Trophic characteristics are commonly proposed to explain this type of bioamplification differences: oligotrophic ecosystems would favor the metal bioaccumulation, while the higher growth rates would favor the metal dilution in eutrophic ecosystems. While tagging experiments allow accessing to the true growth rates of fish, and the utilization of N and C isotopes to the structure of the food webs, most of the studies on mercury bioamplification suffer from the lack of data about the mercury bioavailability (i.e., methylmercury concentration) in the milieus, especially in marine waters, to confirm this interpretation. Here we address the question of the role of the mercury bioavailability in its bioconcentration at the base of the food chain in a meso-eutrophic environment (Bay of Biscay, N-E Atlantic) compared to an oligo-mesotrophic environment (Gulf of Lions, N-W Mediterranean). In both environments, methylmercury (MeHg) distribution profiles have been established in the water columns, and the MeHg concentrations determined in plankton and fish preys. The food web structures and growth rate of the hake were explored through $\delta^{15}N$ distributions and tagging.