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An exotic Ne component in ordinary chondritic chromite?

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Chromite is the most abundant oxide in ordinary chondrites (OCs), and chromite grains increase in size and abundance with increasing petrologic type, indicating they grow by exsolution from plagioclase and olivine during parent body metamorphism [1]. A suite of high-sensitivity Ne data of chromite grains (extracted by acid dissolution from meteorites) has been collected over the last few years, usually in with the intent of determining the solar wind concentration and cosmic-ray exposure age of chromite from fossil and recent (micro)meteorites [2-5]. In all of these studies, the data suggest the presence of a so far unknown Ne component with an abundance of $\sim 3 \times 10^{-9} \text{ cm}^3 \text{ STP } ^{22}\text{Ne}$ per gram of OC chromite and a $^{20}\text{Ne}/^{22}\text{Ne}$ ratio of $\sim 6-8$, perhaps similar or even related to Ne-HL, which is carried by nanodiamonds [6]. We give an overview of all past measurements and provide an outlook over planned additional Ne, Xe measurements of OC chromite.

[1] Bunch et al., 1967, GCA 31, 1569-1582. [2] Heck et al., 2004, Nature 430, 323-325. [3] Heck et al., 2008, MAPS 43, 517-528. [4] Meier et al., 2012, LPSC XLIII, #1131. [5] Meier et al., 2013 LPSC XLIV, #1014. [6]

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Huss & Lewis, 1995, GCA 59, 115-160.

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