**CORRELATED $\varepsilon^{64}$Ni AND $\varepsilon^{62}$Ni IN BULK METEORITE ANALYSES.**

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Variability of neutron rich isotopes in meteorites can yield information about early solar system processes, and the nucleosynthetic sources the accreted to form the solar system. Excesses of neutron rich nuclides in bulk meteorite analyses of iron peak elements were initially reported for Ti [1; 2] and later augmented by similar observations for Cr [3]. This early work has been supported by several subsequent studies using different procedures [4; 5; 6]. Thus, excesses of the neutron rich nuclides of Ni might also be anticipated, but contrasting results have been reported by different groups working on similar meteorites. Notably, some workers have argued for a range in $\varepsilon^{62}$Ni between ordinary and carbonaceous chondrites [7; 8], albeit of different magnitudes, whereas other studies have suggested there is no resolvable mass-independent variability in $\varepsilon^{62}$Ni [9; 10; 11]. However, a common conclusion of all studies is that any mass-independent variability of Ni isotopes in bulk samples is small (<1ε), so detection of these anomalies requires high precision analyses and careful control on accuracy.

This debate can be further explored using $^{64}$Ni, the most neutron rich stable Ni isotope. From theory and earlier measurements on CAIs it is expected that $\varepsilon^{64}$Ni should exhibit larger anomalies than $\varepsilon^{62}$Ni [12], and that the two parameters should be correlated. However, even with the potentially larger variations of $\varepsilon^{64}$Ni, its measurement remains problematic owing to the presence of the isobaric $^{64}$Zn interference.

Here we present advances in Ni isotope analysis, building on the work of Regelous et al [7], in both the chemical separation, with a dramatically reduced Zn blank, and the MC-ICP-MS procedures. This enables us to measure $\varepsilon^{64}$Ni with a reproducibility ~ ±20 ppm 2s.d. and re-examine our earlier $\varepsilon^{62}$Ni measurements. The new measurments of a range of chondrites and irons reaffirm our published $\varepsilon^{62}$Ni data and, moreover, show that they are positively correlated with $\varepsilon^{64}$Ni. We document a range of ~ 100 ppm in $\varepsilon^{64}$Ni for the samples analysed to date. Given the rather different controls on the accuracy of $\varepsilon^{62}$Ni and $\varepsilon^{64}$Ni their correlation provides strong support for the robustness of our observations and thus further evidence for significant variability in the neutron rich nuclides of iron peak nuclides in bulk solar system materials.

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