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Heterogeneity of the Cr isotopes in physically separated components of the Allende CV3 chondrite.

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To constrain the origin of differences in $\varepsilon^{53}Cr$ and ^{54}Cr in bulk rocks of carbonaceous chondries [1, 2], Cr isotopes were analyzed in physically separated components of Allende using the Triton TIMS at FUB.

Physically separated components of Allende show $^{55}Mn/^{52}Cr$ variations from 0.37 to 1.90. Most of these components display variations in $\varepsilon^{53}Cr$ (and $\varepsilon^{54}Cr$), which are independent of their Mn/Cr. These variations result from either i) redistribution of Mn and/or Cr, and/or ii) heterogeneity of initial $^{53}Mn/^{55}Mn$ in different components. A chondrule fraction displays the lowest Mn/Cr and also the lowest $\varepsilon^{53}Cr$ and $\varepsilon^{54}Cr$, presumably because of the evaporation of anomalous ^{53}Cr and ^{54}Cr carriers during thermal processing in the solar nebula. The latter processes may be a main cause for the variations in Mn/Cr, $\varepsilon^{53}Cr$ and $\varepsilon^{54}Cr$ in bulk rocks of some carbonaceous chondrites.

[1] Shukolyukov and Lugmair (2006) EPSL 250, 200–213. [2] Trinquier A., Birck J-L. & Allègre C. J. (2007) APJ 655, 1179-1185.

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