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Modal abundances of accessory phases within clasts in CI chondrites

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CI chondrites are commonly used as reference material for solar system abundance of most elements [1]. Although CI chondrites are breccias with clasts having complex mixtures of different phases such as phyllosilicates, magnetite, pyrrhotite and carbonate, different literature data report a matrix abundance of 95-99 vol% [2,3]. 25 clasts in three thin sections of the CI chondrites Orgueil, Ivuna and Alais were studied by point counting. Phases <5 µm were treated as matrix material. The obtained matrix abundances of studied clasts range from 87.7 to 96.9 vol%. The magnetite abundance varies significantly (1.1-10.7 vol%) and values for pyrrhotite and carbonate can be as high as 2.7 and 3.4 vol%, respectively. However, some clasts are free of sulfides and carbonates >5 µm. Phosphates, only found in 5 fragments, reach up to 0.6 vol%. The results emphasize the importance of brecciation in the evolution of CI chondrites as visible in the mineralogical differences among clasts.

[1] Anders & Grevesse (1989) GCA 53, 197-214. [2] Scott et al. (1996) Cambridge University Press pp. 87-96. [3] Brearley & Jones (1998) Rev. Mineralogy 36, 3-1 -3- 398.

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