THE AMINO ACID AND HYDROCARBON CONTENTS OF THE PARIS METEORITE, THE MOST PRIMITIVE CM CHONDRITE. Z. Martins[1], P. Modica[2], B. Zanda[3], L. S. d'Hendecourt[2], [1]Dept of Earth Science and Engineering, Imperial College London, South Kensington Campus, London SW7 2AZ, UK, E-mail: z.martins@imperial.ac.uk, [2]CNRS - Université Paris XI, Institut d'Astrophysique Spatiale, ''Astrochimie et Origines'', FR 91405 Orsay Cedex, France, [3]Muséum d'Histoire Naturelle, CNRS, 61 rue Buffon, 75005, Paris, France.

Introduction: The Paris meteorite is the least aqueously altered CM chondrite [1-3] on the hydrothermal scale designated by Rubin et al. [4], being a CM2.7/2.8 given the chemical composition of the poorly characterized phases (PCPs) [1]. It has experienced only weak thermal metamorphism [2, 5-7], and shows almost no signs of terrestrial weathering [6, 8, 9]. The comparison between the IR spectra of some of fragments of Paris and the spectra from solid-state materials in molecular clouds indicates a primitive origin for the organic matter in this meteorite [10]. Most of the micron-sized organic particles present in the Paris matrix exhibit $0<\delta D<2000‰$ [11, 12], while its C/H data is significantly lower than in other CMs [12]. Remusat et al. [12] concluded that aqueous alteration on the CM parent body does not induce significant modification on the composition of the organic particles from the insoluble organic matter (IOM) phase of Paris. We have analysed for the first time the amino acid and hydrocarbon contents of the Paris meteorite, in order to understand the effect of aqueous alteration on meteoritic soluble organic matter [13].

The amino acid content of Paris: The amino acid content of the non-hydrolysed and acid-hydrolysed fractions of the Paris meteorite had abundances of 7060 parts-per-billion (ppb) and 15,760 ppb, respectively [13].

In order to test the hypothesis that aqueous alteration on the meteorite parent body is responsible for the high L-enantiomer excess (Lee) value of isovaline in the most aqueously altered carbonaceous meteorites [14,15], we have compared the isovaline Lee values across CM chondrites with different degrees of aqueous alteration [13]. While aqueous alteration does not create by itself an isovaline asymmetry, it may amplify a small enantiomeric excess already present. Our data shows that the Lee for isovaline values increase from $-1.4 \pm 2.6\%$ for the CM2.7/2.8 Paris, to $16.5 \pm 7.5\%$ for the CM2.0 Scott Glacier (SCO) 06043 [12]. The most primitive CM analysed to date, the CM2.7/2.8 Paris has an isovaline Lee close to zero ($-1.4 \pm 2.6\%$), supporting the hypothesis that aqueous alteration is responsible for the high L-enantiomer excess of isovaline observed in the most aqueously altered carbonaceous meteorites [14,15].

Extensive aqueous alteration in the parent body of carbonaceous meteorites may result in the decomposition of α-amino acids and the synthesis of β- and γ-amino acids. In order to confirm this and to further investigate the influence of aqueous alteration on the amino acid abundance and distribution on CM chondrites, we have plotted the relative abundances of β-alanine/glycine for CM chondrites with different degrees of aqueous alteration. Our data show that the relative abundance of β-alanine/glycine increases with increasing aqueous alteration, from the CM2.7/2.8 Paris to the CM2.0 MET 01070. Paris has the lowest relative abundance of β-alanine/glycine (0.15 ± 0.02), which is the smallest β-alanine/glycine ratio observed in CM chondrites [13].

The hydrocarbon content of Paris: The Paris meteorite has 7,670 ppb of aliphatic hydrocarbons (*n*-alkanes) ranging from C_{16} to C_{25} [13]. The most abundant *n*-alkane is heptadecane ($C_{17}H_{36}$) with $2,499 \pm 230$ ppb. The aromatic hydrocarbon content of Paris ranged from 3- to 5-ring non-alkylated polycyclic aromatic hydrocarbons (PAHs), with total abundance of 8,722 ppb [13]. The most abundant aromatic hydrocarbons are fluoranthene ($3,455 \pm 195$ ppb), pyrene ($3,089 \pm 181$ ppb), and phenanthrene ($1,662 \pm 58$ ppb). No alkylated PAH is detected in the Paris meteorite, which seems to be related to the low degree of aqueous alteration on its parent body. Our data supports previous results which indicated that higher relative abundances of alkylated PAHs correlated with a higher degree of aqueous alteration on the meteorite parent body of CM2 chondrites [16].

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