LI AND B ISOTOPIC SYSTEMATICS IN CAIS, CHONDRULES AND DIFFERENTIATED METEORITES.
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Li and B show significant isotopic variations in the different components of meteorites. If part of these variations (in the 10 permil range) can be attributed to magmatic or post-magmatic processes (up to 15‰ variations likely due to diffusion processes have recently been detected for 7Li/6Li ratios in lunar and martian meteorites [1, 2]), variations of higher amplitude (several tens of permil) reflect the presence in the solar system of Li and B having different nuclear sources. One of these nucleosynthetic source is of most interest for early solar system processes, namely the production of Li-Be-B elements from irradiation by solar cosmic rays of the gas and solids of the accreting disk. Such irradiation processes should theoretically produce 6Li-poor Li (7Li/6Li ≈ 2), 11B-rich B (11B/10B up to ≈ 5) and the short lived nuclides of Be, 10Be which decays to 10B with a half-life of 1.5Ma and 7Be which decays to 7Li with a half life of 53 days.

We have previously presented evidences for (i) the presence in chondrules of Li and B isotopic variations [3-5], (ii) the presence in CAIs of 10B excesses due to the in situ decay of 10Be [6] and (iii) the presence in CAIs of 7Li excesses which could be attributed to the in situ decay of 7Be [7]. All these observations can be reconciled in a model where a small fraction of the Li-Be-B elements is produced in the early solar system and mixed in various proportions in the nebula to the precursors of CAIs and chondrules [8]. If the presence of 10B in CAIs is well demonstrated [9, 10], its implication for the existence of irradiation processes in the early solar system is discussed [11].

We shall compare in this talk these previous data acquired on CAIs, chondrules with new data on CAIs and differentiated meteorites (angrites, eucrites, martian and lunar meteorites) to discuss the following questions : (i) were Li and B isotopic compositions homogenized in the nebula, (ii) what are the distribution of 10Be and 7Be in the nebula ? (iii) do the timescales implied by 26Al between CAIs and differentiated meteorites match those inferred from 10Be ? (iv) what is the fraction of the Li and B isotopic variations which can be due to early irradiation processes around the young Sun and not to a recent exposure to galactic cosmic rays ?

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