Experimental investigation for the process of astro organic globules

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Organic globules were found in the Tagish Lake meteorite (carbonaceous chondrite fallen in 2000) and their similarity to biomembranes was suggested based on their IR spectra (Nakamura et al., 2002). On the other hand, film-like products were reported to be formed during the hydrothermal heating of an OH-bearing amino acid (threonine:Thr) solution (Nakashima and Shiota, 2001). In order to simulate formation processes of the organic globules, hydrothermal heating experiments of Thr solutions have been conducted with a porous rock.

By heating 40ml of Thr solution with a piece of porous rock (about 1cm in diameter) in the hydrothermal vessel (about 50ml of volumes) at 160°C for 4 days, organic globules of 2 to 20 micro meter in size were observed under Scanning Electron Microscope (SEM) on the rock surface. Therefore, organic globules can be formed during aqueous alternation of carbonaceous chondrites.