# Organic matter extraction methods

## Extractable (Soluble) Organic Matter (EOM)

The meteorite powder will be solvent extracted by using a mixture of DCM and MeOH (9:1 v/v) and sonication for 10 min, resting for 5 min, and sonication for a further 10 min. Between each sonication, the solution was stirred and left to resettle for 5 min. The solvent solution was then decanted into a round bottom flask, and the process was repeated twice more for each sample. The second and third solvent mixtures were added to the first for each sample and then evaporated by nitrogen blowdown to a minimum volume. About 10-20 mg of (EOM) (if available) on the column. A standard column is prepared by taking a glass column (10 cm x 5.7 mm i.d., a pasteur pipette) plugged with a small amount of glass wool. It is packed dry with activated silica gel (60-120 µm) (approx. 0.6 g), taken recently from the desiccator, made up to a 45 mm column of silica with gentle tapping to bed in the silica. A model pipette is used to establish the 45 mm length. Make the column uniform by passing 3 bed volumes (3.5 mL) *n*-hexane/DCM (4:1 v/v), to waste. The EOM (10-20 mg) in a minimum volume of DCM (ca. 50 µL) is introduced to the top of the column to produce a concentrated band. Allow the solvent to evaporate in the column for about 2 minutes. Using the standard column, Total HCs (aliphatic and aromatics) are collected by eluting with *n*-hexane/DCM (4:1 v/v, 3 mL). Polars are eluted with methanol (MeOH)/DCM (1:1 v/v, 3 mL). The total HC fraction from step 1d is slowly evaporated down using the nitrogen blowing down system, in a 2 mL vial, until a volume of ~50 µL remains. A fresh standard column is prepared and made uniform by passing 3 bed volumes (3.5 mL) *n*-hexane to waste. The Total HC fraction in a minimum volume of hexane (ca. 50 µL) is introduced to the top of the column to produce a concentrated band. Allow the solvent to evaporate in the column for about 2 minutes. HCs are eluted under gravity with *n*-hexane (up to 2.6 mL). Using the standard column, Aromatic HCs are collected after elution of Aliphatic HCs, by eluting with *n*-hexane/DCM (4:1 v/v, 3.5 mL).

## Insoluble Organic Matter

Samples will be dissolved by wetting with Millipore water, and the adding 6m HCl overnight. The next day 36% HCl will added to the samples which were placed on a hot plate at 60°C for four hours, after which the samples were rinsed with millicue water >10x until the pH returned to normal. Once the samples return to ~4.5 pH they will be dried on a hot plate at 35®C overnight. The next day they weill be submerged in HF (concentration 40%) and left to stand overnight. After this treatment the insoluble material will be washed with water until neutrality