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## Deuterium/Hydrogen microscopy in astrogeological material.

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Many primitive meteorites show elevated D/H-ratios relative to terrestrial material. It is believed that this is due to the preservation of the organic molecules which were formed in the presolar molecular cloud [1]. The D/H-ratio varies considerably between different classes of meteorites. This isotopic variation is due to different degrees of mixing of the presolar material with solar system materials [1]. Isotopic measurements of extraterrestrial material collected at Earth provide a way to compare the degree of mixing of the primordial molecules among different solar system material [1].

In recent years a quantitative technique for D/H-ratio microscopy has been developed at Lund Ion Beam Analysis Facility (LIBAF). The technique is derived from the proton-proton scattering technique and has been proven to have the same beneficial features, namely low detection limit, high lateral resolution, and insignificant matrix effects [2, 3]. In this work we present and discuss the results from a measurement on samples from the Tagish Lake meteorite, which is suggested to be one of the most primitive solar system material yet studied [4]. We also present an evaluation of the technique, with results of measurements on a geological standard.

[1] Messenger, S. Nature 404 (2000) 968-971

[2] L. Ros, M. Borysiuk, P. Kristiansson, N. Abdel, M. Elfman, P. Golubev, E.J.C. Nilsson, J. Pallon, Nucl. Instr. Meth. B. 306 (2013) 54-58

[3] L. Ros, M. Borysiuk, P. Kristiansson, N. Abdel, M. Elfman, E.J.C. Nilsson, and J. Pallon. Nucl. Instr. Meth. B (2014), <http://dx.doi.org/10.1016/j.nimb.2014.02.058>

[4] Brown, P. G et al Science 290 (2000) 320-325

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