



**FIGURE A1:** Determination of the linearity limit of the MCT detector of the Bruker Hyperion 3000 microscope at the Geoscience Center Göttingen. (A) Transmission FT-IR measurements of 1 to 8 layers of 1.5  $\mu$ m thin Mylar foils (Fluxana Mylar X-ray film sheets TF-115-345) with increasing cumulative thickness. Up to 8 layers the peak height of the 1342 cm<sup>-1</sup> band increases linearly up to 1.95 absorbance units without deviation from the linear trend, indicating that linearity limit is not yet reached. (B–D) Transmission FT-IR measurements of doubly polished sections of polystyrene hard plastics. The evaluation of the peak heights of the absorption bands at 1747, 1872 and 1943 cm<sup>-1</sup> as function of sample thickness indicates a deviation from the linear trend above 2.2 absorbance, indicating that the MCT detector has a linear response between 0 and at least 2 absorbance units.