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Introduction: In recent years, we have received requests for meteorite sample sections to be prepared without using epoxy impregnation or mounting. The reasoning for these requests ranges from potential contamination of analyses from epoxy chemical components to degradation of instrumental vacuum from epoxy outgassing (e.g., SEM, SIMS, EPMA, etc.).

An alternative approach that we employ involves sawing off a 1-5 mm thick wafer of the sample. The wafer is ground using silica carbide lapping media wetted with 190 proof ethyl alcohol to make both sides flat and parallel. The sample is then polished on one or both sides using diamond paste or dry diamond powder on a rotating lap wheel until the desired finish is obtained. The sample is cleaned in between steps using 200 proof ethyl alcohol in an ultrasonic cleaner.

Friable and altered samples need to have higher thickness in order for polishing to be attempted. Without epoxy to hold the sample together or a glass slide for backing, the sample needs additional material to provide the necessary support structure. The machining steps of this process need to be undertaken at a much slower speed than in traditional thin or thick section preparation.

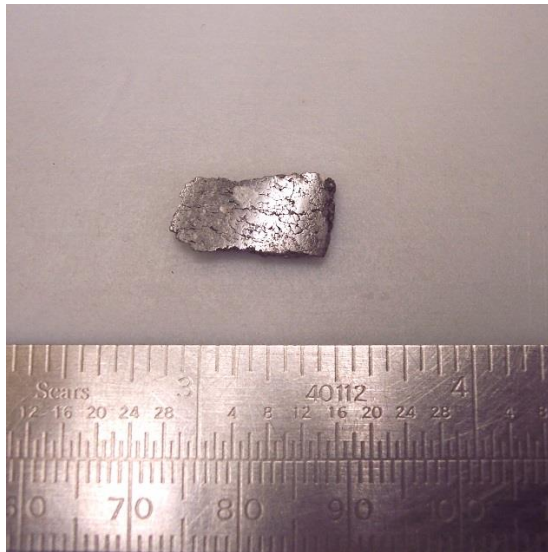


Fig.1 – MAC 88 105 ,182 polished wafer. (NASA JSC)