

**Microwave plasma etcher.** Helgi Skúli Skúlason, Snorri Ingvarsson, Science Institute, University of Iceland. sthi@hi.is

We have built a plasma etcher from a modified commercial microwave oven and a home made gas handling system. It can be used to clean organic contaminants off a wide range of materials, such as semiconductors, ceramics and metals.

The microwaves generated in the oven are used to ionize a process gas, either Ar or O<sub>2</sub>, thus generating a plasma. This plasma gently sputters (it has a low accelerating voltage) and/or reacts with contaminants on the surface of a sample sitting in the plasma, removes them and leaves the sample's surface clean. The plasma does not affect the substrate material in any other ways than by removing weakly bound materials ("dirt") from its surface. This method of etching produces (only in some cases) trace amounts of carbon dioxide and water, i.e. there is no toxic gas waste to deal with as with other methods such as reactive ion etching (Silane, chloride-, or fluoride-compounds). Although this method is extremely useful for sample cleaning for its ease of use and rapid turnaround, it is not suitable for "finely-tuned" or selective etching, in which cases one would choose to work with lower operating pressure and carefully selected process gases.

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