Etching Microwave Silicon [EMSi]-Microwave Enhanced Fast Deep Anisotropic Etching of Silicon for Micro-Electromechanical Systems [MEMS]

Jan A. Dziuban* and Rafal Walczak

Institute of Microsystem Technology, Wroclaw University of Technology
Janiszewski 11/17 Str., 50-372 Wroclaw, Poland

(Received April 21, 2000; accepted January 20, 2001)

Key words: micromechanics, micromachining, MEMS, silicon, wet etching, anisotropy, fast, microwave

A new method of fast wet anisotropic silicon micromachining is described. The new process provides significantly more rapid etching which is applicable in deep silicon micromachining for micro-electromechanical systems (MEMS). The process characteristics in a KOH:water mixture with a wide range of concentrations (3M–10M) and temperatures (60°C–90°C) are presented. The etching of silicon in an NH₄OH:water solution and spectacular etching in deionised water have been achieved. MEMS structures fabricated by the new process in a new machine are shown.

*Corresponding author, e-mail address: jad@wtm.ite.pwr.wroc.pl