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EFFECT OF ULTRASONIC FREQUENCY ON CHEMICAL ETCHING PROCESS

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ABSTRACT

In this work, ultrasonically enhanced chemical etching was employed to fabricate porous silicon layer. Porous silicon layer was fabricated in p-type (111) orientation silicon by using HF solution, and HNO_3. It was found the structure of porous silicon layer on p-type Si was improved by ultrasonic. Porous silicon micro cavities with much higher quality factors can be fabricated by this method. The improved quality induced by ultrasonic etching can be ascribed to increased rates of escape of hydrogen bubbles and other etched chemical species from the porous silicon pillars' surface. The effect is attributable to effective change in the concentration of free holes carriers. Ultrasound has led to indicating probably a change in bonding configuration, and increase in oxidation. Also, a correlation was established between the ultrasonic treatment and the microstructure.