ABSTRACT OF THE INVENTION

A method for staining a wafer containing a semiconductor device is disclosed which properly delineates the various layers of the semiconductor device and provides good contrast for proper testing and diagnosis of problems using a scanning electron microscope. After grinding, lapping and polishing a surface of the semiconductor device, the surface is ion beam etched, reactive ion etched and stained. The staining solution is made from 1 part by volume hydrofluoric acid, 3 parts by volume nitric acid, and 6 parts by volume acetic acid. The staining solution is cooled and subjected to a light to slow the reaction of the staining solution with the semiconductor device. This prevents structure collapse and under or over etching, and provides an easily controllable staining process.

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