Oxide Etching

INTRODUCTION

In order to carry out selective diffusion into silicon, the silicon wafer is oxidized and then coated with a liquid photoresist, which after drying, form a tough photosensitive film. Selective exposure of this thin film (by means of UV light) followed by development of the film resulted in the exposed portions forming an etch resistance pattern. Subsequent etching removes the unexposed portions of the oxide layer, thus enabling selective diffusion into these areas. Typical photoresist processing details have been outlined elsewhere but it is relevant in this section to point out that adequate postbaking of the photoresist is essential in order to prevent undercutting of the oxide layer.

The etchant most commonly used are buffered hydrofluoric acid and 5% HF. The former is used when a controlled etch is required as opposed to an uncontrolled etch in the latter case.

Typical etching rates are as follows:
Buffered HF (J.T.Baker MOS Grade 1:10): 667Å/min at 25°C
5% HF(diluted 20:1 from 48% HF): 350Å/min at 25°C

NOTE
Etch rate is exponentially dependent on temperature.