

ABSTRACT OF THE DISCLOSURE

ETCHING SOLUTION FOR TUNGSTEN AND GST FILMS

Described herein is an etching solution suitable for both tungsten-containing metals and GST metals, which comprises: water; at least one phenolic derivative compound having at least two hydroxyl groups; at least one strong base selected from the group consisting of (i) a quaternary base; (ii) an organic amine; and (iii) a metal hydroxide; optionally an ammonium salt of an organic acid; and optionally a water-miscible solvent, wherein the pH of the etching solution is 10 or greater, and wherein the etching solution is substantially free of a peroxide oxidizer and a metal ion-containing oxidizer.