

Adhesion property of Cr, Al and Cu thin films deposited on polycarbonate by magnetron sputtering

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In this paper, adhesion properties of Cr, Al and Cu thin films that deposited on polycarbonate by magnetron sputtering were studied. Cr deposited on Polycarbonate without surface treatment, bias voltage. Al deposited on polycarbonate with Cr interlayer and without interlayer. Cu deposited on polycarbonate only Cu and with Cr interlayer. Polycarbonate deposited Cu with Cr interlayer were treated with atmospheric plasma treatment system (0,~5min) and Cr/Cu films deposited with various bias voltage (0~300V). Adhesion test of Cr, Al and Cu films on substrate of Polycarbonate was performed with Pull-Off Adhesion Tester (ASTM D4541) as well as cross-cut test. Structure of polycarbonate after plasma surface treatment was analyzed by FT-IR. The adhesion strength of Cr, Al, Cu films on polycarbonate was 1.90, 0.4 and 0.4MPa and adhesion strength of Al, Cu films with Cr interlayer were 1.98, 0.82MPa. As increase of plasma treatment time of polycarbonate and bias voltage, The Adhesion strength of Cu film with Cr interlayer increased and improved significantly comparative with non-plasma treatment, non bias voltage. At 5min plasma treatment and voltage of -300V, adhesive strength was maximum (1.02Mpa). Detailed experimental results on the adhesion strength of Cr/Cu thin films deposited on polycarbonate will be presented.

Keyword: adhesion test; polycarbonate; magnetron sputtering; bias voltage; plasma treatment