

CMP-Cu 薄膜の表面活性化常温直接接合における真空露出量の影響の評価

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Effect of Exposure to Vacuum Condition in Room-Temperature Direct Bonding of CMP-Cu Thin Films by Surface Activated Bonding (SAB) Method

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Abstract

In this study, we optimized the vacuum condition for direct bonding of CMP-Cu films using the surface activated bonding (SAB) method at room temperature. The quality of bonding with the SAB method depends strongly on the cleanness of the surface activated by the Ar atom beam irradiation. Therefore, the relationship between the vacuum condition and bonded area was evaluated with the amount of exposure ($\text{Pa} \cdot \text{s}$) as the parameter. Our results show that the critical exposure condition to obtain a full bonded area on the surface is around $0.1 \text{ Pa} \cdot \text{s}$. The numbers of molecules colliding with the active surface conceivably determined the cleanness of the surface, and XPS observation showed that oxidation of the surface could be prevented at this level of exposure.

Key Words: Surface Activated Bonding (SAB) Method, CMP-Cu, Exposure, X-Ray Photoelectron Spectroscopy (XPS)