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Gettering by CF_4-Ar Plasma-Treated Titanium within Anodically Bonded Glass-Silicon Microcavities

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The gettering of CF_4-Ar plasma-treated titanium films has been studied by X-ray photoelectron spectroscopy, optical microscopy and field emission scanning electron microscopy. This study shows a convenient way to eliminate the native oxide impurities from the titanium surface before getter activation. A vacuum-packaged environment and the activation conditions for 2 mm × 1.8 mm × 2500 Å titanium getter films were realized by a glass-silicon anodic bonding process at 400°C and a 40 min thermal treatment at 500°C, respectively. The surface characteristics of the titanium films were analyzed before and after packaging to determine the role of fluorine. The fluorine coverage on the titanium surface as a result of plasma treatment reveals a new gettering mechanism with high oxygen-capturing potential.

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