

放射線照射法により ABS 樹脂板に固定化された Pd ナノ粒子の化学状態と無電解めっき膜の密着性の関係

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Relationship between adhesion of electroless plating film and chemical state of Pd nanoparticles on ABS substrate immobilized by radiation irradiation method (*Graduate School of Engineering, Osaka University*) ○Naoto Uegaki, Satoshi Seino, Yuji Ohkubo, Takashi Nakagawa

Electroless plating film with high adhesion strength was obtained by using Pd nanoparticles immobilized by radiation method as catalysts¹⁾. However, it is still unknown which composition of ABS resin (acrylonitrile, butadiene, styrene) contributes to the high adhesion strength in this method. In this study, relationship between adhesion of electroless plating film and chemical states of Pd immobilized on the surface of ABS, AS, and PS substrates was investigated. Polymer substrate was enclosed in aqueous solutions of Pd ion. The solution was irradiated and Pd nanoparticles were immobilized. The obtained samples were characterized by ICP-AES, XPS and so on. Figure 1 shows the Pd3d-XPS spectra of prepared Pd/polymer substrates before electroless Cu plating treatment. The peaks derived from Pd coordinated to carbonyl group and from Pd metal were observed. Relationship between the chemical state of Pd and the adhesion strength of electroless plating film were discussed.

Keywords : Radiation; Nanoparticles; ABS; Chemical states

放射線を利用した手法により、Pd ナノ粒子を ABS 樹脂板に固定化でき、Pd ナノ粒子を触媒として、密着性の高い無電解めっき膜が得られことが報告されている¹⁾。しかし、本手法において ABS 樹脂のどの組成(アクリロニトリル、ブタジエン、スチレン)が高い密着性に寄与しているかは未解明である。そこで本研究では、ABS に加え、AS、PS 樹脂板に固定化された Pd ナノ粒子の化学状態と無電解めっき膜の密着性との関係を調査した。Pd イオン水溶液に含浸した樹脂板に放射線を照射し、Pd ナノ粒子を固定化した。得られた Pd/樹脂基板は ICP-AES、XPS など分析を行った。めっき処理前の Pd/樹脂板の Pd3d-XPS スペクトルを Figure 1 に示す。Pd がカルボニル基の酸素に配位している状態と金属 Pd に由来するピークがみられた。これら Pd の化学状態とめっき膜の密着性との関係について議論する。

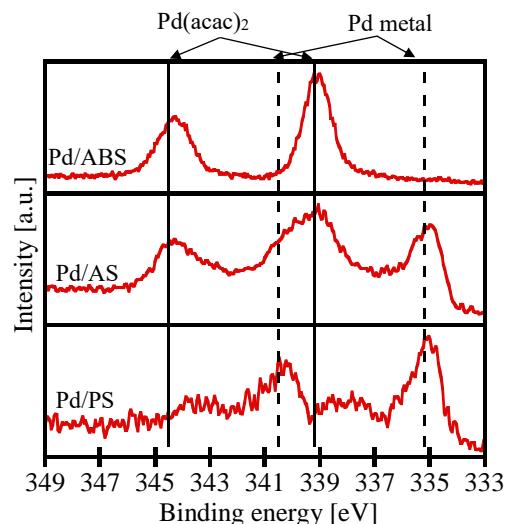


Figure 1 Pd3d-XPS spectra of prepared Pd/polymer substrates before electroless Cu plating treatment.

- 1) 上垣直人 他, 第 101 日本化学会春季年会講演予稿集, A07-2am-01 (2021)