

Relationship Between pH and Temperature of Electroless Nickel Plating Solution

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Abstract

pH is expressed mathematically as $\text{pH} = -\log[\text{H}^+]$, is a measure of the hydrogen ion concentration, $[\text{H}^+]$ to specify the acidity or basicity of an aqueous solution. The pH scale usually ranges from 0 to 14. Every aqueous solution can be measured to determine its pH value. The pH values below 7.0 express the acidity, above 7.0 are alkalinity and pH 7.0 is a neutral solution. The solution pH can be determined by indicator or by measurement using pH sensor, which measuring the voltage generated between a glass electrode and a reference electrode according to the Nernst Equation. The pH value of solutions depends on the temperature and the activity of contained ions. In nickel electroless plating process, the controlled pH value in some limited ranges are extremely important to achieve optimal deposition rate, phosphorus content as well as solution stability. Basically, nickel electroless plating solution contains of Ni^{2+} ions, reducing agent, buffer and complexing agents. The plating processes are normally carried out at 82-92°C. However, the change of its pH values with temperatures does not follow any rule.

Thus, the purpose of study is to understand the relationship between pH and temperature of some based solutions and electroless nickel plating solutions. The change of pH with changing temperatures is explained by view of the thermal dynamic and the practical measurements.

Foam 발생이 없는 냉간 압연 강판용 상온 탈지제 개발 Non-foaming degreasing agent for cold rolled steel sheet process

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초 록 : 현재 업계에서 사용 중인 대부분의 탈지제는 중온 및 고온에서 사용하는 제품이 많으며, 거품의 발생 또한 많으므로 소포제를 넣지 않고서는 사용이 불가능한 약품이 대부분이다. 탈지제 거품의 발생은 탈지제의 세정력을 높이기 위해 주로 사용되는 음이온성 계면활성제의 특성에 의해 나타나게 되는데, 본 연구에서는 음이온성 계면활성제를 사용하지 않음으로 기포의 발생을 억제하고, 동시에 상온에서 사용할 수 있는 약품을 개발함으로써 생산 공정에서의 원가절감과 신뢰성 및 양산성의 향상을 도모하는데 그 목적이 있다.