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# Investigation of electrical properties of Ni/Crystal Violet ( $C_{25}H_{30}ClN_3$ )/*n*-Si/Al diode as a function of temperature

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## Abstract

In this study, Crystal Violet material was used for interface layer of Schottky diode applications. Firstly, chemical cleaning process have been made for boron doped *n*-Si crystals. After, Al metal was coated on the one surface of crystals by thermal evaporation and crystal violet materials were coated on other surface of crystals with spin coating method (coating parameters; 800 rpm for 60 s). Lastly, Ni metal was coated on Crystal Violet by sputtering. So, we obtained the Ni/Crystal Violet /*n*-Si/Al Schottky type diode. After the fabrication process of diode, the current-voltage (*I*-*V*) and capacity-voltage (*C*-*V*) measurements of Ni/Crystal Violet /*n*-Si/Al Schottky type diode were taken for various temperatures. The some basic diode parameters such as ideality factor (*n*), barrier height ( $\Phi_b$ ) and series resistance (*R*<sub>s</sub>) of Ni/Crystal Violet /*n*-Si/Al were calculated from *I*-*V* measurements using different methods (Thermionic Emission, Cheung and Norde functions). Also, diode parameters such as Fermi energy level, diffusion potential, carrier concentration and barrier height were calculated from the *C*-*V* measurements of diode as a function of temperature.

**Key Words:** Crystal Violet, Schottky diode, Thermionic Emission, Norde, Current-Voltage, Capacity-Voltage.

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