Preparation And Analysis of Solid Solutions Used As Pigments

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A b s t r a c t

The aim of this work is not only the synthesis of ceramic pigment with spinel structure using low energy and inexpensive minerals but also throw some light on the relations between the structure and the color of obtained pigment.

The most commonly used coloring constituents in ceramic systems characterized by an incomplete d shell, particularly V, Cr, Mn, Fe, Co, Ni and Cu.

In this study color pigments were formed by tow methods ceramic method and sol-gel method.

Ceramic method used to prepare simple spinels of Ni,Co and Ni starting from a mixture of $M(NO_3)_2$ M=Ni,Co,Mg or Ni and aluminum chloride where calcinations at ١٠٠٠^{o}Cfor ٣ hr.three components spinels also prepared by adding $MgCl_2$or $Mg(OH)_2$ in different molar ratio to $M(NO_3)_2$ M=Ni,Co,Mg or Ni to aluminum chloride where calcinations at ١٠٠٠^{o}C for ٣ hr . gel method used to prepare simple spinels of Ni,Co,Mg and Cu starting from a mixture of $M(NO_3)_2$M=Ni,Co,Mg or Ni and aluminum chloride using medium ethylene glycol, calcinations at ٧٠٠^{o}Cfor ٢ hr.mixed spinels also prepared in the sam way where $CuNiAl_2O_4$, $CuCoAl_2O_4$, $NiCoAl_2O_4$prepared using tow solvents a medium (ethylene glycol and polyproplyne glycol).

The phase composition and microstructure characterization of obtained pigments were evaluated by X-ray diffraction, and transmission electron microscope. the results indicated that all produced powder are in nanometer range and high hidden for metallic surfaces when it used as pigments for coating metallic surfaces.

Some of the produced powder are used as pigments where it mixed with alkyd and diluted with suitable organic solvent and applied as coating materials on metallic surfaces .

Key words :spinel ,pigment, $CuNiAl_2O_4$, $CuCoAl_2O_4$, $NiCoAl_2O_4$, $CoAl_2O_4$, $NiAl_2O$, $CuAl_2O$

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