

Technology Transfer

Area of Technology: Chemical Engineering

Title of the Innovation: MICRO-PARTICLES OF TITANIUM OXIDE AND KAOLIN

Brief About Innovation

White pigments are one of the key ingredients for paint industry and many other commercial products that have reflective properties. They are essential in the manufacturing of functional fillers and extender pigments. Commonly known white pigments are antimony White (Sb_2O_3), Barium sulphate (BaSO_4) Lithopone: $\text{BaSO}_4 \cdot \text{ZnS}$ Cremnitz White (basic lead (II) carbonate $[(\text{PbCO}_3)_2 \cdot \text{Pb}(\text{OH})_2]$, Zinc oxide (ZnO), Zinc sulfide (ZnS), Titanium (IV) oxide (TiO_2). Due to unavailability of raw-materials, antimony and barium products have very little use. Whereas zinc based products are rarely used in order to enhance cost effectiveness and lead toxicity has caused the prevention of its use. Titanium oxide (TiO_2) also known as titania finds application in a number of industry such as paints, printing ink, plastics, food, paper, cosmetics, synthetic fibers, rubber, condensers, paint colors, crayons, ceramics and electronic components. Titanium oxide due to its white colour finds applicability in the paint industry.

Salient Features:

- The present invention relates to nano chemistry and more particularly relates to a method of preparation of white pigment.
- The primary object of the invention is to develop a micro particle calcined kaolin and titanium dioxide with the desired refractive index of 2.1 and for the use in paint industry.
- It is a further object of this invention to propose precipitation of TiO_2 on calcined kaolin with ammonium titanyl hexafluoride to produce micro particles of kaolin coated with thin layer of $\text{TiO}_2 \cdot \text{XH}_2\text{O}$.
- The present invention discloses a process of preparation of micro-particles of calcined kaolin and titanium dioxide comprises obtaining a suspension of calcined kaolin; acidifying the suspension of calcined kaolin and neutralization at suitable pH to generate aluminium phosphate (AlPO_4) -coated kaolin particles; adding ammonium titanyl hexafluoride and urea solution to the aluminium phosphate (AlPO_4) -coated kaolin particles with vigorous stirring suitable temperature to obtain titanium dioxide coated kaolin particle; and neutralization, calcinizing and pulverizing titanium dioxide coated kaolin particles to obtain microparticles of calcined kaolin and titanium dioxide.