Contribution of Nanotechnology in the Paints and Coatings

[1]Dr.V.Nalathambi, [2]G.Suresh
[1]Asst. Professor, Dept. of Chemical Engineering, Arulmigu Meenakshi Amman College of Engineering, Thiruvannamalai
[2]Student, Dept. of Chemical Engineering, Arulmigu Meenakshi Amman College of Engineering, Thiruvannamalai

Abstract

This paper will discuss about the technology that will be attracted by the every fields and it will be used in the every field to give the more performance. This paper will shows about the nono paints and the contribution of nano paints in the field of chemical engineering. In this the nano technology was created in the paints which will be acted as the repellent for the many structures. It will have the several advantages in every field the nano paints will be used as the good chemical resistance. It will have the anti reflection resistance. And also it will be used for the various purpose.

Keytems : *nano paints, chemical substance, scratch resistance.*

I. INTRODUCTION

This paper will shows about the nano technology used in the field of chemical engineering as the nano paints. Since the nano particles are very smaller in nature it will used in every process to show its better performance. It will have the more metabolic properties which will be incorporated in the paints to give more advantageous process. It will inherent the properties of changing of colors in the materials and reducing the size without changing the chemical composites. It is a significant composition in every field. It will be possible in manufacturing of products in atomic molecules and mind blowing concepts which have the major contribution in the field of chemical engineering. In this the best part is to manipulate the individual atom particles which will show the better contribution.

II. EXISTING SYSTEM

In the existing system the paints will be made up of the natural colors. The paints and coating are only created for the attraction and for the privacy process. There is no technology used in the paintings. It is only the mixture of several components. It only produces the low clear coating which will not change its color. It will not have the resistance properties. Also the normal paints will be eradicated in some period of time it will use the process of dying agent and the different manufacturing process. Also the normal paints will use the plastic substances and it will harmful to the environment. Some paint will emit the adverse radiations which will be suppose to give the more manufacturing process and also for the environment defects. In this the hybrid materials will be affected by providing the direct inorganic components. Which will expose its toxic substances.

III. PROPOSED METHODOLOGY

In the proposed system it will provide a multilayer automotive coating system. It will give the clear coat in the metallic underneath layer. It will be depending on the size of the morphology. This system provides the stronger materials; it will provide the self repairing paints. The nano particle will have the several components such as Al_2O_3, SiO_2, ZrO_2 and TiO_2. And it will form the clear coat matrix which will enhanced for the larger applications it will also used as the scratch resistance.

IV. PROPERTIES OF NANO PARTICLES

In this process the size of the nano particles are smaller to the wave length but it is visible to the light since it is the very smaller particle. The most critical characteristics of the nano particles is it will have the very high volume ratio and it will have the desired chemical properties such as heat resistance weight reduction and some other properties. It will also have the electron resistance and magnetic force compared with the high metabolic substances. The formulations of paints and coating have the higher rate of substance for the nano particles that will be process the main product of systems that will achieves to develop the paint formulation in the nano technologies. It will also provide the self cleaning process. This will extends to produce the unique composition and better strength and flexibility. The nano material also has the UV protection. The metal oxides like zinc oxide and the UV blocker this will incur the nano particles and act as a repellent for the ultraviolet radiation. It will also act as a sun protector.

V. NANO PAINTING –A SCRATCH RESISTANCE

In this process the nano paints will have the micron sized inorganic fillers which will have the nano powder that consist of 40 to 60 nm of effective fillers and the nano particle includes ZrO2, AlOOH, SiO2.

Fig 1: Nano Paint with Scratch Resistance

The nano particle will have the homogeneous distribution that will provide more reliability and provide the resistance structure for the scratching. The nano particle will have the alumina substances which will protect them from the ultra violet radiations. The performance of alumina contains the composite coating that will provide the unimolecular structure. It will provide the better surface appearance and more chemical resistance. The evident of the nano particle which will provide the UV curable coating and the nine fold module statement.

VI. OIL REPELLENT NATURE OF PAINT

This paint will also provide the nature of oil repellent nature. The paint will have the self cleaning property the nano particle will have the fluro methyl group which will provide the natural properties if the carbon components along with this it will have the ammonium poly phosphate and melamine that reduces the chemical and mechanical properties of the substrates.

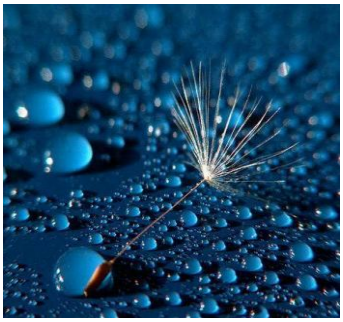

Fig 2: Nano Particles with Oil Repellent Nature

The incorporation of nano particles will improve the density of coating that will produce the organic substances. The synthesis of inorganic nano particles will have the superior tri biological properties. It will also provide the oil based and water based lubricants that will give the efficient process in the nano paint.

This process will also have the anti fouling properties which have the adhesion of microbes under the marine organisms which underneath some material products that will produce the neat cleaning process. The nano coating components will provide the repellent structure from the germs, virus, algae and other metal components. The nano particle will also extents it future for the anti finger print products in this the adhesion will reduce the oxidation of durability and will provide the time to clean the surface of the process that will reduce the significance. The tri biological properties of nano particles will provide the frictional loss and the material wear property.

This nano paint will also have the corrosion resistance for coating that is influenced by the pigment binner. The properties of coating will be determined by the transportation. And it was specified by the electrolyte in the coating system. This will have the anti corrosion property which will be already proved by taking the samples of nano paints. The arrangements of nano pigments in the nano paints will be used to change the colors in the nano paints will be exposed the field of attraction. This concept was relatively applicable in the automobile sector.

Fig 3: Wall Smart Nano Paint

This will provide the uniform surface with the high quality of glass coating surface which will have the scattering power of nano particles that will eradicate the discontinuous film and the coating system.

VII.USES OF NANO PAINTS

The nano paints are useful for the asthma patients in the medical field it will be useful in the hospitals, homes industrial locations and in storage rooms which will reduce the bad odor and also prevent by the plastering materials. The dampness will causes the expensive to peel off form the structure. Also the paints and the coats are very useful for the asset maintenance it will also used as the water proofing agent. The application of multi functional material will improve the anti corrosive characteristic that will form the protective surface layer which will act against the pollution.

The nano paint will also use the hybrid technology. It will have the comprehensive property which will be added advantage for the nano particles for the oil repellent nature and behavior. These kind of surface in the paints can be prepared by the optimum surface and by the surface energy. The increasing roughness in the water will repell the nano particles. The titanium dioxide in the nano paint will

be oxidized as a safer substance which will detect the humans form the harmful effects. It will be acted as the catalytic agent which will give more preferable solutions in nano paints and the coatings. The nano paints will be different from the other conversion paints since it has more atoms located in the surface of nano particles.

VIII. CONCLUSION

This paper provides the solution for the nano particles that will be used in the paints to create more beneficiary effects in the field of chemical engineering. The nano paint will take a new version in this paper which has the properties of oil repellent factor, scratch resistance, the anti corrosion resistance and flame resistance. Therefore it is more secure and reliable. This nano paint will have the properties of hybrid coating structure which will produce more advantageous factors in the chemical field as well as to the environment and the human being. Also it extends the future of corrosion protection of metal resistance with the chemical and physiochemical properties. It will have the positive potential power not only in the economic development also for the human growth. It will also conserve the natural resources.

REFERENCES

[1] N. Kouloumbi, P. Pantazopoulou, P.Moundoulas,Pigment &ResinTechnol.2003, 32(2), 89–99.

[2] L. Hochmannov, Eur. Coat. J. 2003, 9,26–32.

[3] Jui-Ming Yeh, Shir-Joe Liou, Chih-GuangLin, Yen-Po Chang, Yuan-Hsiang Yu, Chi-Feng Cheng, J. Appl. Polym. Sci.2004, 92,1970–1976.

[4] V. Palanivel, W.J. Van Ooij, in: Silanes andOther CouplingAgents (Ed. K.L. Mittal), Volume 3, VSP, 2004, pp. 135159.

[5] S. Monte, Polymer Paint Color J. December2003.

[6] Voevodin, N. N., Kurdziel, J. W. and Mantz, R., Corrosion protectionfor aerospace aluminumalloys by Modified Self-assembledNAnophase Particle (MSNAP) sol–gel.Surf. Coat. Technol., 2006, 201, 1080–1084.

[7] Balbyshev, V. N., Anderson, K. L., Sinsawat, A., Farmer, B. L.and Donley, M. S., Modeling of nano-sized macromolecules insilane-based self-assembled nano-phase particle coatings. Prog.Org. Coat., 2003, 47, 337–341.

[8] Li, R. and Chen, L., A paint containing nano titanium oxide andnano silver, and its preparation method. Chinese Patent, CN10027622, 2005.

[9] F.A.P. Thomas, J.A.W. Stoks, A. Buegman,US Patent 6291054, September 18,2001.

[10] http://www.nano-x.de/index.html

[11] W. Barthlott, C. Neinhuis, Planta1997, 202, 1–8.

[12] A. Nakajima, K. Hashimoto, T. Watanabe, Monatshefte für Chemie 2001, 132, 31–41.

[13] R. Blossey, Nature Materials 2003, 2301–306.

[14] I.P. Parkin, R.G. Palgrave, J. Mater. Chem.2005, 15(17), 1689 1695.

[15] Y.T. Cheng, D. Rodak, Appl. Phys. Lett.2005. 86 (144101) 1–3.

[16] A. Fujishima, K. Hashimoto, T.Watanabe,TiO2 Photocatalysis: Fundamentals and Applications.BKC, Tokyo, 1999, p. 66.

[17] T. Watanabe, Bull. Ceram. Soc. Jpn.1996,31, 837–840.

[18] A. Fujishima, T.A. Rao, D.A. Tyrk, J. Photochem.Photobiol. C: Photochem. Rev. 2000,1, 1–21.

[19] M. A. AbdElGhaffer, E. A. M. youssef preparation and charaterisation of high performance anticorrosive phosphomolybdate pigments, Pigment and resin Technology, vol35,1,2006.

[20] G.Batis, P.Pantazopoulou, Properties of oxygen converter slag as anticorrosive pigment, Pigment &resin Technology Vol30, 2, 2001.

[21] S.E.Faidi,J.D.Scantlebury,An electrochemical study of zinc containing epoxy coating on mild steel,corrosion science,Vol35,5- 8,pp 1319-1328,2003.

[22] Introduction to nanotecnology,charles p.poole Jr.Frank J.Owens, John Wiley&sons(Asia) Pvt Ltd,Singapore.