J Material Sci Eng 2016, 5:4(Suppl)
http://dx.doi.org/10.4172/2169-0022.C1.041

conferenceseries.com

2nd International Conference and Expo on
Ceramics & Composite Materials
July 25-26, 2016 Berlin, Germany

Migration of new bio-based additives from rigid and plasticized PVC stabilized with epoxidized sunflower oil in the soil

N Lardjane[1], N Belhaneche-Bensemra[2] and V Massardier[3]
[1]Université Mouloud Mammeri de Tizi-Ouzou, Algeria
[2]Ecole Nationale Polytechnique, Algeria
[3]Université de Lyon, France

Plasticizers, primarily phthalates, are added to the originally rigid PVC polymer in order to make flexible products. Stabilizers are indispensable to provide the necessary stability of the PVC polymer against heat, light and weathering. Applicable stabilizers are heavy metals and organotin compounds as well as organic co-stabilizers, depending on the desired product properties. The significant increase of the use of PVC induces an increase in the use of plasticizers (phthalates) and thus generates the pollution of air, soil and water. In a previous work, commercial sunflower oil was epoxidized and the effects of ESO on the thermal degradation and stabilization of PVC in the presence of metal carboxylates were investigated. Vegetable oils are renewable raw materials. Their conversion to useful intermediates for polymeric materials is significant because of their low cost, ready availability, and possible biodegradability. The use of environmentally benign additives is another way to avoid the health and environmental issues. For that purpose, alternative plasticizer (DINA) and heat stabilizers (ESO) are used. The artificial aging of the PVC samples was investigated under uncontrolled temperature in the laboratory for 4 months. The modifications of the structure of the polymer were followed by Fourier transform infrared spectroscopy (FTIR). The morphological changes were followed by scanning electron microscopy (SEM). Furthermore, the evolution of the bacterial growth, variation of pH and variation of mass were considered.

nadiaalar@yahoo.fr

Some nanograined ferrites and perovskites for catalytic combustion of acetone at low temperature

Nicolae Rezlescu[1], Elena Rezlescu[1], Paul Dorin Popa[1], Corneliu Doroftei[1] and Maria Ignat[2]
[1]National Institute of Research and Development for Technical Physics, Romania
[2]Al. I. Cuza University, Romania

Two types of nanograined oxide compounds, $CuFe_2O_4$, $MgFe_2O_4$, $Ni0._5Co0._5Fe_2O_4$, with spinel-type structure, and $SrMnO_3$, $FeMnO_3$, $La_{0.6}Pb_{0.2}Ca_{0.2}MnO_3$ with perovskite-type structure, were prepared by sol-gel self-combustion method and tested for the catalytic combustion of dilute acetone in air. Their structure and surface properties were investigated by X-ray diffraction (XRD), scanning electron microscopy (SEM), BET surface area measurements and energy-dispersive X-ray spectroscopy (EDX). We chose acetone as a VOC model because, among all VOCs, it is a common organic solvent extensively used in the manufacture of plastics, fibers, drugs and other chemicals. The catalytic activity studies revealed that between these two types of catalysts, the perovskite catalysts exhibited the best activity in the catalytic combustion of acetone. The acetone conversion degree over perovskite catalysts can exceed 95% at 300°C, while over ferrospinel catalysts it is of about 70%. Our experimental results indicate that the $SrMnO_3$ and $La_{0.6}Pb_{0.2}Ca_{0.2}MnO_3$ perovskites are the preferred catalysts in the catalytic combustion of acetone at low temperatures. The time stability of $La_{0.6}Pb_{0.2}Ca_{0.2}MnO_3$ catalyst for acetone combustion was also investigated and no deactivation was observed for 36 h at 250°C.

nicolae.rezlescu@gmail.com