



(<http://ipindia.nic.in/index.htm>)



(<http://ipindia.nic.in/index.htm>)

Patent Search

Invention Title	PROCESS FOR THE PRODUCTION OF IMIDAZOLE-NITRILE BASED CATALYST FOR EPOXY RESINS
Publication Number	52/2022
Publication Date	30/12/2022
Publication Type	INA
Application Number	202241071828
Application Filing Date	13/12/2022
Priority Number	
Priority Country	
Priority Date	
Field Of Invention	POLYMER TECHNOLOGY
Classification (IPC)	C08G0059500000, C08G0059680000, G03F0007038000, C08L0063000000, C08G0059400000

Inventor

Name	Address	Country	Nationality
Dr. RAMACHANDRAN SASIKUMAR	NO:21, SOUTH STREET, KANAKKANKUPPAM, GINGEE TALUK, VILLUPURAM, TAMILNADU, INDIA, 604151.	India	India
Mr. KHAJA NAJIMUDEEN MOHAMED MYDEEN	116/86, PERIYA KOTHBA PALLIVASAL SOUTH EAST STREET, MELAPALAYAM, TIRUNELVELI, TAMILNADU, INDIA, 627005.	India	India
Dr. ARUMUGAM HARIHARAN	1226, VAIGAI STREET, SUTHAGAR NAGAR, L. N. PURAM, PANRUTI, CUDDALORE, TAMILNADU, INDIA, 607106.	India	India
Dr. MUTHUKARUPPAN ALAGAR	PLOT 66, 5TH MAIN ROAD, SWAMINATHANAGAR, KOTTIVAKKAM, CHENNAI, TAMILNADU, INDIA, 600041.	India	India

Applicant

Name	Address	Country	Nationality
PSG INSTITUTE OF TECHNOLOGY AND APPLIED RESEARCH	THE PRINCIPAL, AVINASHI ROAD, NEELAMBUR, COIMBATORE, TAMILNADU, INDIA, 641062.	India	India

Abstract:

The imidazole core based (nitrile) cyano-derivative was synthesized using terephthalaldehyde and diammomaleonitrile in the presence of xylene solvent at 135°C for 12 hours in the absence of any catalysts with yield of about 86%. The product resulted was characterized for its molecular structure, storage stability and cure behavior. The varying weight percentage quantities of imidazole core based (nitrile) cyano-derivative was mixed with different combination of epoxy resin having epoxy equivalents of 180-190 with varying nature of amine curatives, viz., DDM, DDE, DDS, DICY, and melamine and their curing temperature and storage life were ascertained. The optimum weight percentage of latent thermal initiator required for one pack epoxy systems was found to be 1wt%. The storage stability was found to be 1 to 2 days for epoxy-DDM with TDMN and all other systems comprising epoxy resin with amines and TDMN thermal initiator have about 90 days. The polymerization (curing) temperature observed for DDM, DDE, DDS, DICY, and melamine based one pack epoxy systems with TDMN are 75, 150, 120, 150 and 180°C respectively. The present invention offers number of advantages over conventional latent thermal initiators in terms of method of production in the absence of any catalysts, efficiency of catalytic activity relatively with lower weight percentage, cure behavior, energy saving and ease of formulation and fabrication of composite components. The latent thermal initiator also acts as cross-linker and structural modifier, capable of influencing thermal stability and strength properties due to their bulky hetero-cyclic molecular structure. The present invention is considered as the cutting-edge concept in the field of latent thermal initiator for epoxy curing technology.

Complete Specification

Field of invention

The present invention deals with the production of novel latent thermal initiator for epoxy resins significantly cures at lower temperature through a facile process route. The present invention offers a facile synthetic and cutting-edge process route for production of latent thermal initiator for epoxy resins capable of utilizing in the form of single pack system for fabrication of various industrial products including the manufacture of prepregs for advanced high-performance composites. The present invention involves the synthesis of new types of modified imidazole derivative with molecularly built-in (nitrile) cyano-functional groups, which are expected to contribute to significant characteristics towards latent curing of epoxy resins. The present invention offers number of advantages over the existing methodologies adopted for production of different types of latent thermal initiators reported as on date, in terms of chemical molecular structure, reaction time, method of reaction, workup methodology, shelf-life, cure temperature, and thermal properties. The present invention is considered as a novel and facile synthesis of skeletal modified imidazole core built-in (nitrile) cyano- derivative as latent thermal initiator suitable for curing wide range of industrially valuable one pack epoxy systems consisting different amino compounds as curatives.

Background of the invention

Epoxy resin is one of the most important classes of thermo-setting polymeric materials widely used as high-performance adhesives, coatings, sealants, encapsulants, and

[View Application Status](#)

Terms & conditions (<http://ipindia.gov.in/terms-conditions.htm>) Privacy Policy (<http://ipindia.gov.in/privacy-policy.htm>) Copyright (<http://ipindia.gov.in/copyright.htm>)
Hyperlinking Policy (<http://ipindia.gov.in/hyperlinking-policy.htm>) Accessibility (<http://ipindia.gov.in/accessibility.htm>) Archive (<http://ipindia.gov.in/archive.htm>)
Contact Us (<http://ipindia.gov.in/contact-us.htm>) Help (<http://ipindia.gov.in/help.htm>)
Content Owned, updated and maintained by Intellectual Property India, All Rights Reserved.

Page last updated on: 26/06/2019