Patent Search

Invention Title	PRODUCTION OF EXTREME RANGE OF PH INDICATORS FROM BENZOXAZINES
Publication Number	18/2023
Publication Date	05/05/2023
Publication Type	INA
Application Number	202341027342
Application Filing Date	13/04/2023
Priority Number	
Priority Country	
Priority Date	
Field Of Invention	BIO-CHEMISTRY
Classification (IPC)	A61P 251400, B32B 270400, C07D 651600, C07D 651800, C07D 653600

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Abstract:

In the present invention discloses the production of bisphenol BA-aliphatic amine based hydrophobic polybenzoxazines coated paper developed for proximate pH indicator kit application. The bisphenol BA was prepared using phenol and 4-hydroxybenzaldehyde in the presence of acid catalyst. The different types of benzoxazines were prepared using bisphenol BA (BBA), aliphatic amines (n-butyl amine (ba), n-hexyl amine (ha), 2-ethylhexyl amine (2-eha), dodecyl amine (dda), and octadecylamine (oda)) and paraformaldehyde through Mannich condensation reaction. The structural behaviour of prepared bisphenol BA and corresponding benzoxazines were characterised by FTIR, 'HNMR and MASS spectroscopic techniques. The curing behaviour of benzoxazines was studied by DSC analysis. The ring opening polymerisation of BBA-ba, BBA-ha, BBA-2eha, BBA-ddaand BBA-oda was observed at 234, 236, 236, 240 and 243 °C respectively. The thermal stability of polybenzoxazine was studied thermogravimetric analysis technique. The polybenzoxazines coated cellulose pH indicator paper was prepared and their hydrophobic behaviour was studied by goniometer. The value of water contact angle of poly(BBA ba), poly(BBA-ha), poly(BBA-2eha), poly(BBA-dda) and poly(BBA-oda) coated paper strip was observed at 122, 124, 125, 130 and 133 ±2° respectively. Further, the polybenzoxazines coated cellulose paper pH indicator kit useful for the determination of high extreme concentration of acid in the range of less than zero (0) pH and high concentration of base in the range between ll pH and l4pH. The polybenzoxazine coated cellulose paper pH indicator kit exhibit orange colour in 0.0 pH, dark orange in -1,0 pH and light red in -1.5 pH and dark red in -1.8 pH. Similarly, the polybenzoxazine coated cellulose paper pH indicator kit exhibit light violet colour in 1 lpH, dark violet in 12 pH and light blue in 13 pH and dark blue in 14 pH. The polybenzoxazine coated cellulose paper pH kit can be used for more than 5 cycles.

Complete Specification

Field of the invention

The present invention deals with the production of bisphenol-BA/aliphatic amine based hydrophobic polybenzoxazines for proximate pH indicator kit application. The bisphenol-BA (BBA) was prepared using phenol and 4-hydroxybenzaldehyde in the presence of an acid catalyst. The benzoxazines were prepared using bisphenol-BA (BBA), aliphatic amines (n-butyl amine (ba), n-hexyl amine (ha), 2-ethylhexyl amine (2-eha), dodecyl amine (dda), and octadecylamine (oda)) and paraformaldehyde through Mannich condensation reaction. The structural behaviour of benzoxazines was characterized by FTIR, *HNMR and MASS spectroscopic techniques. The curing behaviour of benzoxazines was studied by DSC analysis. The ring opening polymerization of BBA-ba, BBA-ha, BBA-2eha, BBA-dda and BBA-oda was observed at 234, 236, 236, 240 and 243°C respectively. The thermal stability of polybenzoxazines was studied using thermogravimetric analysis technique. The polybenzoxazines coated cellulose paper was prepared and their hydrophobic behaviour was studied by goniometer. The values of water contact angle of different benzoxazines coated cellulose paper strips namely poly (BBA-ba), poly(BBA-ha), poly(BBA-2eha), poly(BBA-dda) and poly(BBA-oda) were observed at 122,124, 125, 130 and 133 ±2° respectively. Further, the polybenzoxazines coated cellulose paper pH indicator developed was ascertained for their working performance over the pH range between -1.0 and 14 at different acidic pH scales viz., 0, -1.0, -1.5, -1.8 and different basic PH scales of 11,12,13 and 14. It was also ascertained that the polybenzoxazines coated cellulose paper kit exhibit orange colour in 0.0 pH, dark orange in -1.0 pH and light red in -1.5 pH and dark red in -1.8 pH, light violet colour in 1 lpH, dark violet in 12 pH, light blue in 13 pH and dark blue in 14 pH. The polybenzoxazines coated cellulose paper pH kit can be active for more than 5 cycles.

Background of the invention

View Application Status

Page last updated on: 26/06/2019