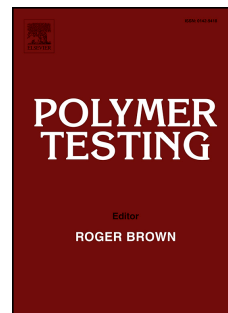


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Analysis Method

Determination of Epoxy Groups in Epoxy Resins by Reaction-based Headspace**Gas Chromatography**Wei-Qi Xie^{1,2} and Xin-Sheng Chai^{1*}

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Abstract: This work reports on a new method for the determination of epoxy groups in epoxy resins by reaction-based headspace gas chromatography (HS-GC). After epoxy resins reacted with hydrochloric acid (HCl) solution, the remaining HCl reacted with bicarbonate solution in a closed headspace vial to form carbon dioxide that was measured by HS-GC. It was found that the first reaction can be finished in 30 min at room temperature and the second reaction, together with headspace equilibration, can be achieved within 15 min at 60 °C. The results showed that the method has a good precision and accuracy, in which the relative standard deviation in the repeatability measurement was 4.20%, and the relative differences between the data obtained by the HS-GC method and the reference method were within 8.04%. The present method is simple, efficient, and suitable for the used in the epoxy resin related research and applications.

Keywords: Epoxy groups; Headspace; Gas chromatography; Epoxy resins; Reaction-based

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