

IDENTIFICATION AND CHARACTERISATION OF ADDITIVES IN COLOURANTS BY ADVANCED ANALYTICAL TECHNIQUES.

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ABSTRACT

Poly(ethylene glycol) (PEG) based additives are often used in the coatings industry during the production of paints and colourants. These additives are used to enhance properties such as stabilization of pigment dispersions, wetting of pigments and improvement of open time and freeze/thaw stability. Very often the exact chemistry of these commercial additives is unknown and this is a limitation during product developments. The identification and characterisation of polymers in a multi-component system continues to be one of the challenging tasks. This research presents the use of various techniques to identify and characterise PEG-based additives that are used in a multi-component colourant formulation. The molar mass distribution of PEG-based additives could be determined with liquid chromatography mass spectrometry (LC-MS) in size exclusion mode (SEC) and at critical conditions of adsorption (LCCC) of PEGs. Using a combination of LC-MS, proton nuclear magnetic resonance spectroscopy (^1H NMR), pyrolysis gas chromatography (py-GC-MS) and Fourier transform infrared (FTIR), different additives could be identified in terms of the number and type of polymer end groups. The efficiency of the separation and identification of a blend of additives in a colourant formulation will also be discussed.