

## Colorimetric Detection of Ceftazidime through Azo Dye Formation on Polyethylenimine-Melamine Foam

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**Abstract :** Ceftazidime is an antibiotic drug commonly used to treat several human and veterinary infections. However, the presence of ceftazidime residues in the environment may induce microbial resistance and cause side effects to humans. Therefore, monitoring the level of ceftazidime in environmental resources is important. In this work, a melamine foam platform was proposed for simultaneous extraction and colorimetric detection of ceftazidime based on the azo dye formation on the surface. The melamine foam was chemically modified with polyethyleneimine (PEI) and characterized by scanning electron microscopy (SEM) and Fourier transform infrared spectroscopy (FTIR). Ceftazidime is a sample that was extracted on the PEI-modified melamine foam and further reacted with nitrite in an acidic medium to form an intermediate diazonium ion. The diazotized molecule underwent an azo coupling reaction with chromotropic acid to generate a red-colored compound. The material color changed from pale yellow to pink depending on the ceftazidime concentration. The photo of the obtained material was taken by a smartphone camera and the color intensity was determined by Image J software. The material fabrication and ceftazidime extraction and detection procedures were optimized. The detection of a sub-ppm level of ceftazidime was achieved without using a complex analytical instrument.

**Keywords :** colorimetric detection, ceftazidime, melamine foam, extraction, azo dye

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