

Intermediates analysis on phenol electrolysis using UV-Visible spectroscopy and liquid chromatography-mass spectrometry

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【Introduction】 Phenol, classified as a hazardous substance, is an important industrial product which is widely used in the manufacture of resins, preservatives and pharmaceuticals. As an economical and environmentally friendly phenol wastewater treatment method, electrolysis has broad application prospects. However, electrocatalytic oxidation of organic matter is a complex process, and factors such as electrode materials, current density, and pH value all affect the reaction. Therefore, identifying the intermediate products of the electrolysis reaction and clarifying their reaction pathways and mechanisms have significant value for process optimization and industrial production.

【Experiment】 Platinum-titanium electrodes were used in the electrolysis of phenol, and sodium chloride was used as the electrolyte. UV-Visible spectrum of the electrolyte was measured at 200-600 nm using a quartz cuvette. Liquid chromatography-mass spectrometry (LC-MS) were used to analyze the intermediate products in phenol electrolysis process.

【Results】 Five important intermediates in the electrolysis of phenol were identified: o-chlorophenol, p-chlorophenol, 2,4-dichlorophenol, 2,6-dichlorophenol, and 2,4,6-trichlorophenol. Further details will be shown in the poster presentation.

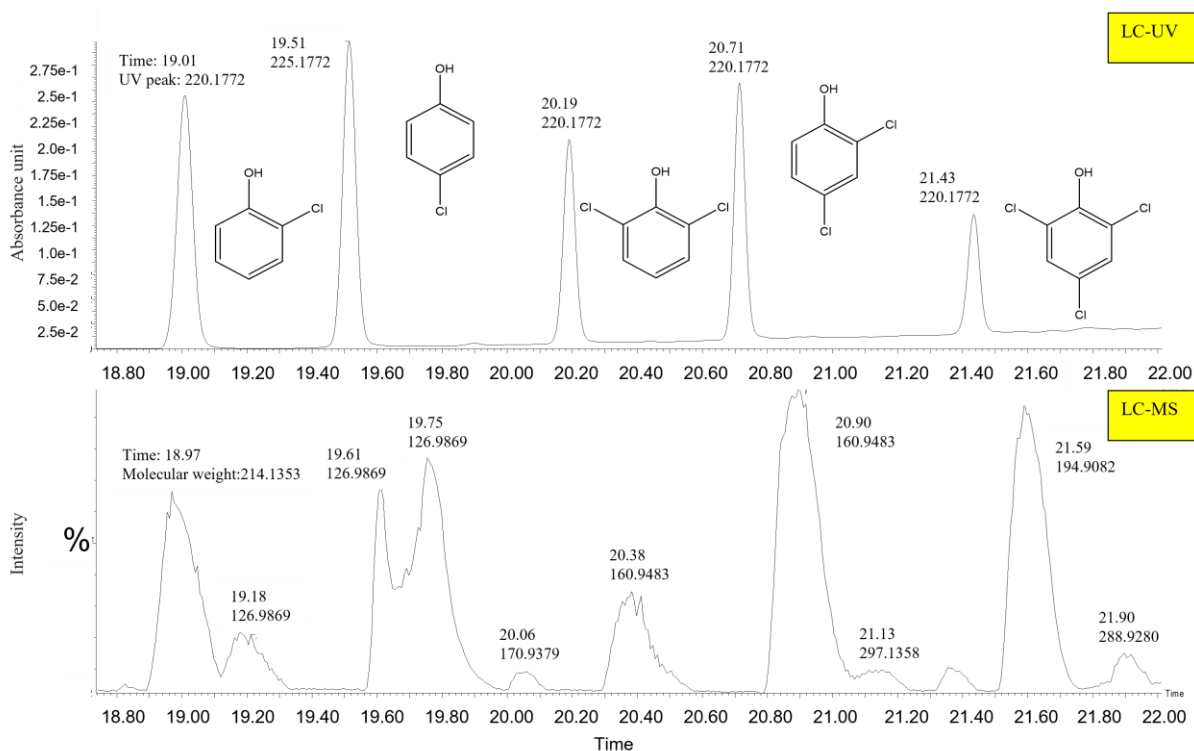


Figure 1. LC-UV and LC-MS spectrometry of phenol electrolyte when reacting for 30 minutes