

Extraction rate of valuable compounds from peanut skin waste by ethanol-assisted supercritical carbon dioxide: Modelling and optimization

ABSTRACT

Response Surface Methodology (RSM) was employed to optimize the extraction rate of phenolic and flavonoid contents from peanut skin by supercritical carbon dioxide (ScCO₂) assisted by ethanol as entrainer. The studied extraction parameters were pressure (10 to 30 MPa), temperature (40 to 70 °C), and the ratio of ethanol (2.5 to 7.5%). Brunner's and Esquivel's models were applied to evaluate the extraction rate. The best-operating conditions, in the tested range, were 30 MPa, 40 °C, and 4.64% of ethanol ratio, with a maximum extraction rate of 0.22 mg/g.sec and 0.19 mg/g.sec of the phenolic and flavonoid content, respectively. The findings concluded that higher-pressure condition has a significant impact on the extraction rate of phenolic and flavonoid