

## ENHANCED EXTRACTION OF ANTIOXIDANT POLYPHENOLS FROM *MORINGA OLEIFERA* LAM. LEAVES USING A BIOMOLECULE-BASED LOW-TRANSITION TEMPERATURE MIXTURE

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In this study, the extraction of polyphenols from *Moringa oleifera* leaves was investigated, using a biomolecule-based low-transition temperature mixture (LTTM), composed of glycerol and sodium acetate. The first step was to optimise LTTM concentration ( $C_{LTTM}$ ) and the molar ratio ( $R_{mol}$ ) of glycerol-to-sodium acetate, by employing a Box-Behnken experimental design. Following this, a kinetic assay was undertaken to assess the effect of temperature. A maximum yield in total polyphenols ( $Y_{TP} = 53.80$  mg gallic acid equivalents per g lyophilised material) was achieved using a  $C_{LTTM} = 80\%$  (w/v) and a  $R_{mol} = 6$ . The extraction followed a second-order model, requiring activation energy ( $E_a$ ) of  $55.71 \text{ kJ mol}^{-1}$ . Comparative evaluation using 80% ethanol showed that the LTTM used was significantly more efficient in extracting polyphenols and flavonoids, yielding extracts with higher reducing power. However, results concerning the antiradical activity were contradictory. Liquid chromatography-diode array-mass spectrometry examination of both the LTTM and the hydroalcoholic extracts revealed some qualitative differences, which might indicate selectivity of the LTTM towards relatively polar substances.