Acrylamide is a well-known carcinogenic contaminant formed at high temperatures during the cooking of starch containing foods. Acrylamide hit the headlines again internationally in 2018, when a judge in California ruled acrylamide fell under the State’s Proposition 65 labelling requirements and EU Regulation 2017/2158 was enacted establishing mitigation measures and benchmark levels for the reduction of the presence of acrylamide in food in Europe. The analysis of acrylamide in processed foods has several analytical challenges to consider, including sufficient retention, the complexity of the matrices and the wide range concentrations likely.

A new method, using modified QuEChERS and LC-MS/MS with a high strength silica C18 analytical column, has been developed, to provide a rapid, cost-effective approach for quantifying acrylamide in coffee. Solid phase extraction (SPE) and dispersive solid phase extraction (dSPE) devices were evaluated, to identify simple and efficient cleanup of the samples, to provide selective MRM transitions.

Single laboratory method validation was completed using a selection of store purchased coffee products and a coffee reference material. Acrylamide-d3 was used as an internal standard to correct for any variability through the whole method, including any LC-MS/MS matrix effects. Validation of the method demonstrated excellent performance in terms of linearity, accuracy, precision and repeatability, in accordance with the criteria outlined in Commission Regulation (EU) 2017/2158. Furthermore, results from the analysis of a coffee reference material demonstrated that the analytical method, using a simple and rapid clean up procedure, was suitable for the determination of acrylamide, in accordance with regulatory requirements.