

ABSTRACT:

A newsol–gelhybrid coating, polydimethylsiloxane–2-hydroxymethyl-18-crown-6 (PDMS–2OHMe18C6) was prepared in-house for use in solidphasemicroextraction (SPME). The three compositions produced were assessed for its extraction efficiency towards three selected organophosphorus pesticides (OPPs) based on peak area extracted obtained from gas chromatography with electron capture detection. All three compositions showed superior extraction efficiencies compared to commercial 100 μm PDMS fiber. The composition showing best extraction performance was used to obtain optimized SPME conditions: 75 $^{\circ}\text{C}$ extraction temperature, 10 min extraction time, 120 rpm stirring rate, desorption time 5 min, desorption temperature 250 $^{\circ}\text{C}$ and 1.5% (w/v) of NaCl salt addition. The method detection limits ($S/N = 3$) of the OPPs with the newsol–gelhybrid material ranged from 4.5 to 4.8 ng g^{-1} , which is well below the maximum residue limit set by Codex Alimentarius Commission and European Commission. Percentage recovery of OPPs from strawberry, green apple and grape samples with the newhybridsol–gel SPME material ranged from 65 to 125% with good precision of the method (%RSD) ranging from 0.3 to 7.4%.