Supporting Information

Mass spectrometry was carried out on a TripleTOF 5600 system (Sciex). Samples were diluted 1:1 with alkaline buffer (0.3 % ammonium hydroxide in methanol) and directly infused using an electronically controlled syringe pump. Each sample was acquired for 1 min using identical system settings for all samples (capillary temperature 150 °C, curtain gas: 35 psi N2, ion source gas 1:20 psi N2, ion source gas 2: 25 psi N2, ion spray voltage: -4 kV).

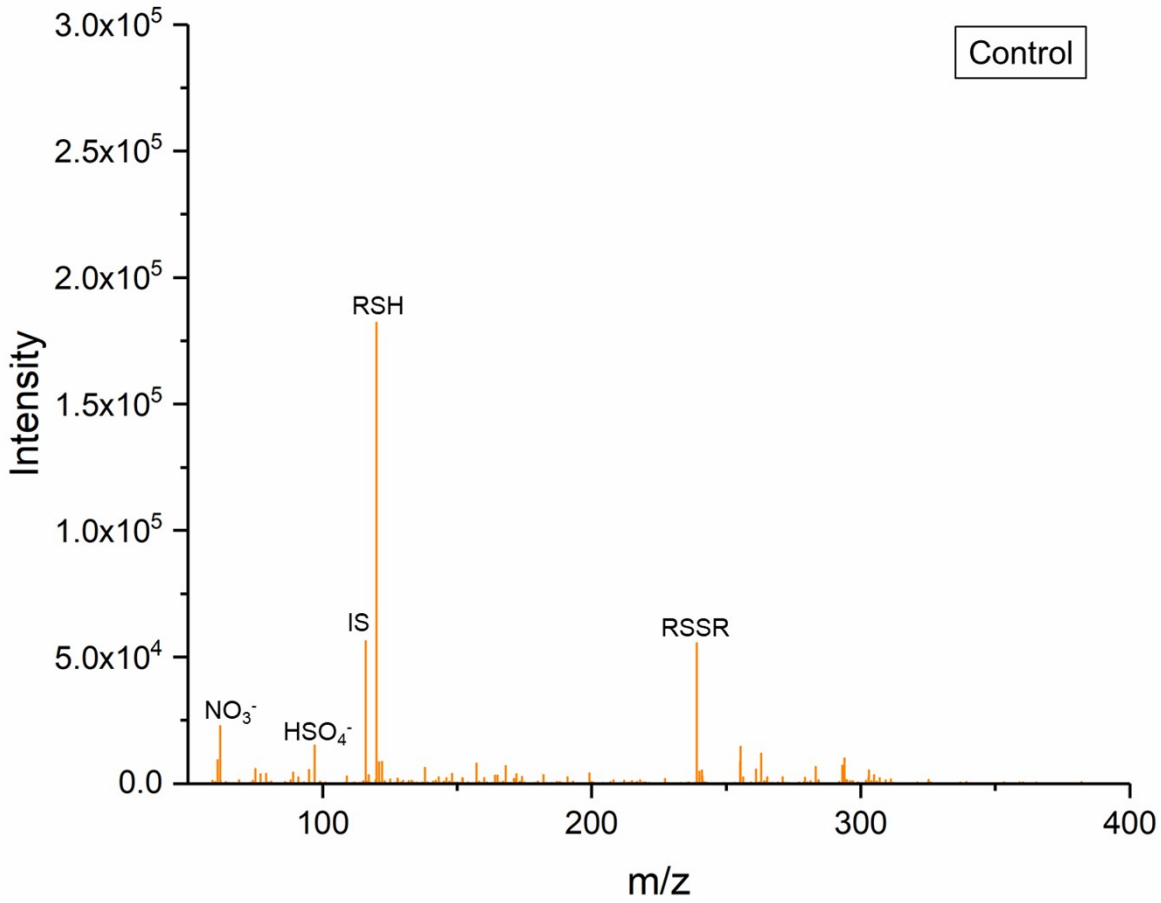

Fig. 1: HRMS (direct infusion, positive mode) cysteine 300 µM in $H_2{}^{16}O$ (control)

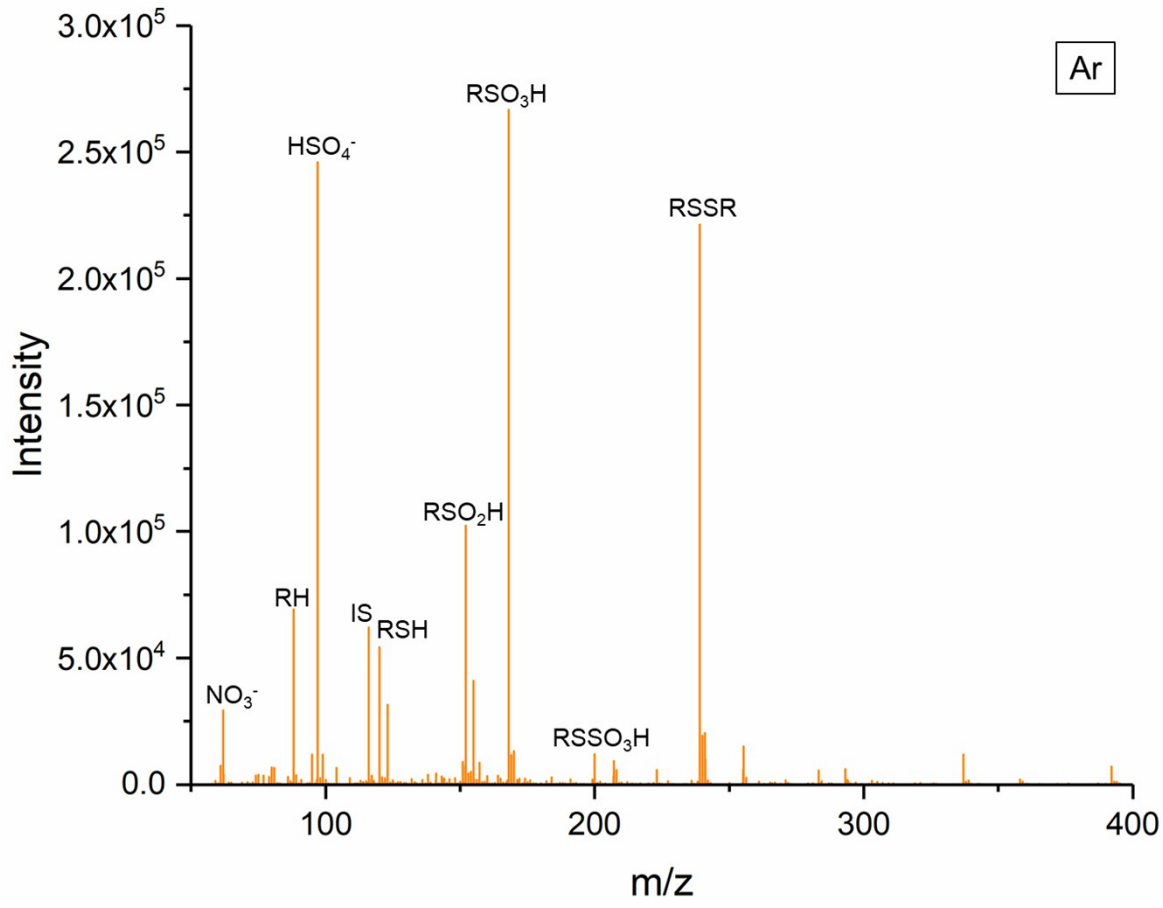

Fig. 2: HRMS (direct infusion, positive mode) cysteine 300 µM in $H_2{}^{16}O$, 1 min argon plasma treatment

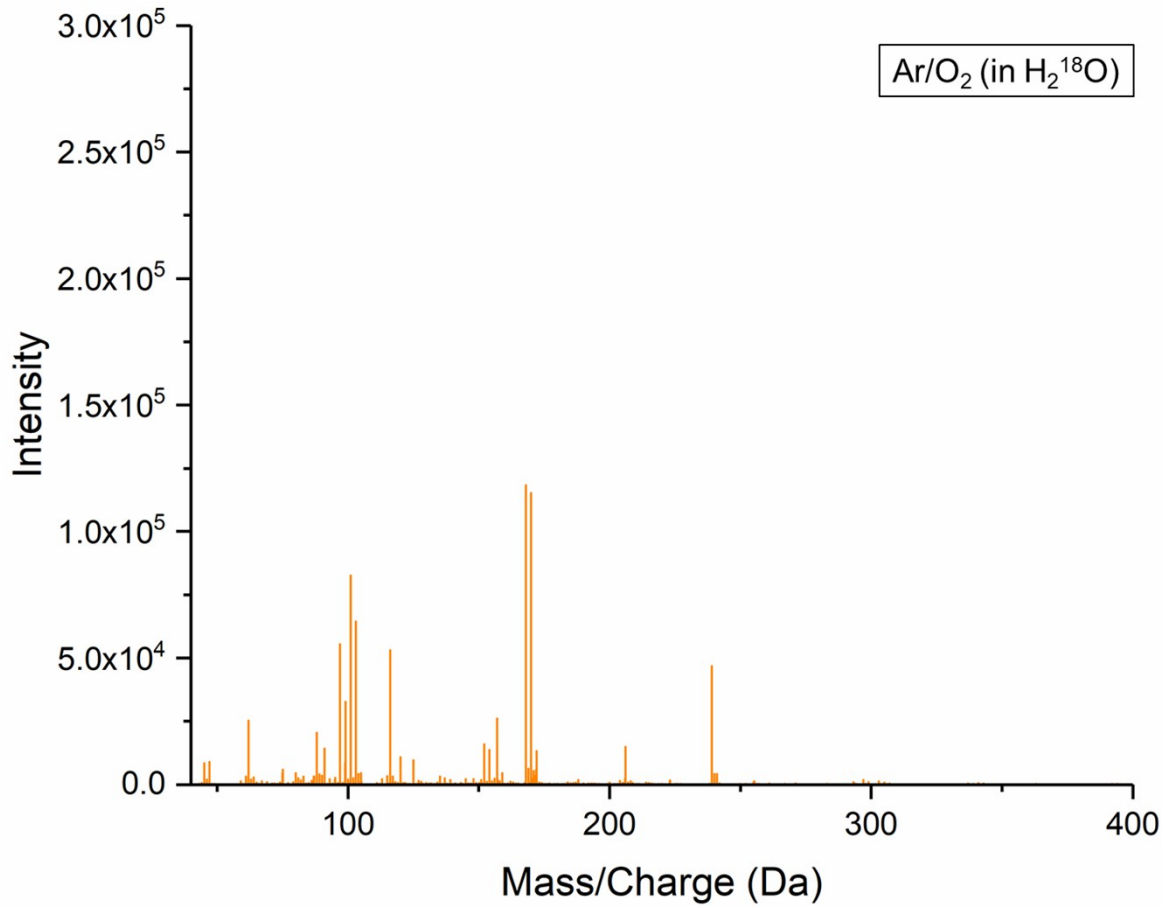

Fig. 3: HRMS (direct infusion, positive mode) cysteine 300 µM dissolved in $H_2{}^{18}O$, 1 min argon plasma treatment

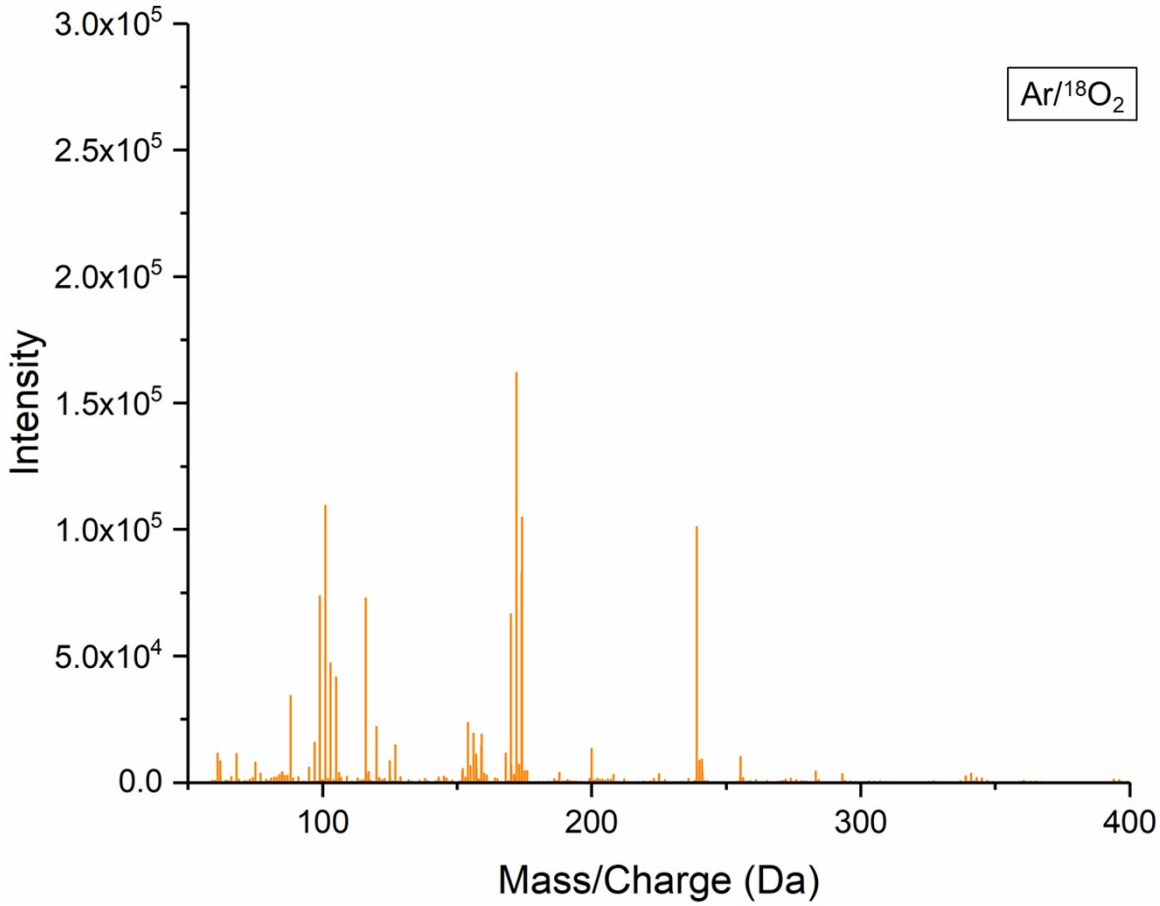

Fig. 4: HRMS (direct infusion, positive mode) cysteine 300 µM dissolved in $H_2{}^{16}O$, 1 min argon/$^{18}O_2$ plasma treatment