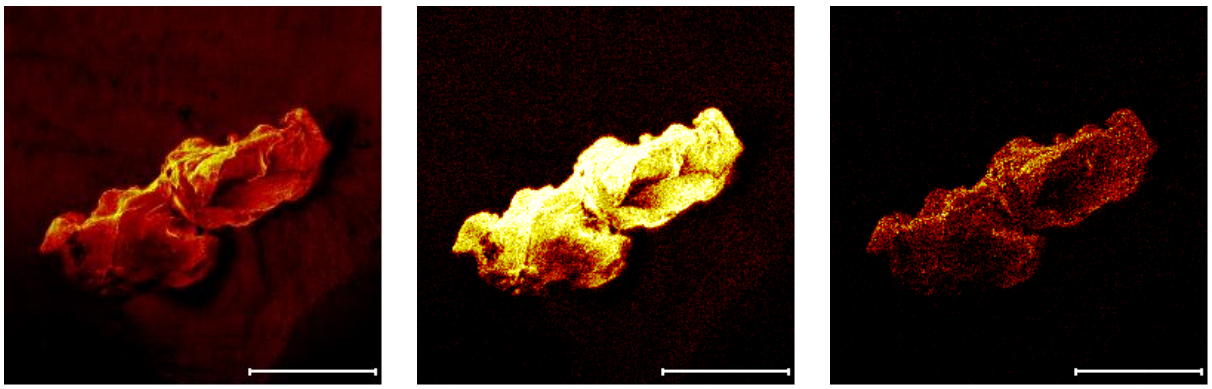
**Plasma coating of particles and the resulting coating's visualization via ToF-SIMS**

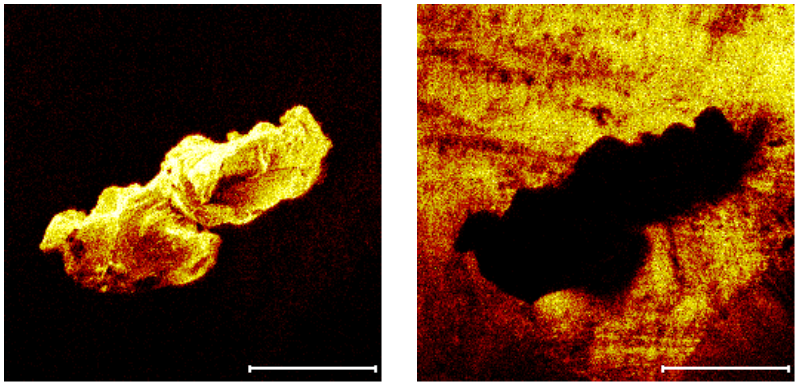
Michl, T.[1], Coad, B.[2], Hüsler, A.[1], Vasilev, K.[1] and Griesser, H.[1]

[1] University of South Australia, Australia, [2] University of Adelaide, Australia

Research focusing on plasma coating of particles is scarce in comparison to the large amount of work done with macroscopic solid materials. One of the reasons for this discrepancy is the more challenging design of a vacuum plasma reactor with moving parts. These moving parts are required to effectively agitate the particles during the plasma deposition for a homogenous coating process. We here report transforming a commercially available rotary evaporator into a plasma reactor by adding custom electrodes and vacuum tubing. This type of design offers low building cost, convenience of use, ease of cleaning, flexibility, facile vacuum sealing and achieves homogenous coating of particles. For demonstration purposes, we plasma polymerized perfluorooctane (PFO) onto micron-sized polystyrene particles. Subsequent analysis with XPS, ToF-SIMS and water contact angle measurement revealed a homogenous coating containing fluorine covering the microparticles. This was visualized using spatial ToF-SIMS (Figure 1) in positive ion mode; imaging the respective fluorocarbon fragments of the coated particles embedded into an Indium matrix for better charge compensation. As evident from the images, the particles were not only visualized using ToF-SIMS, but also the homogeneity of the fluorocarbon coating was verified.



Total Ion $CF_3$ $CF_2$



CF Indium

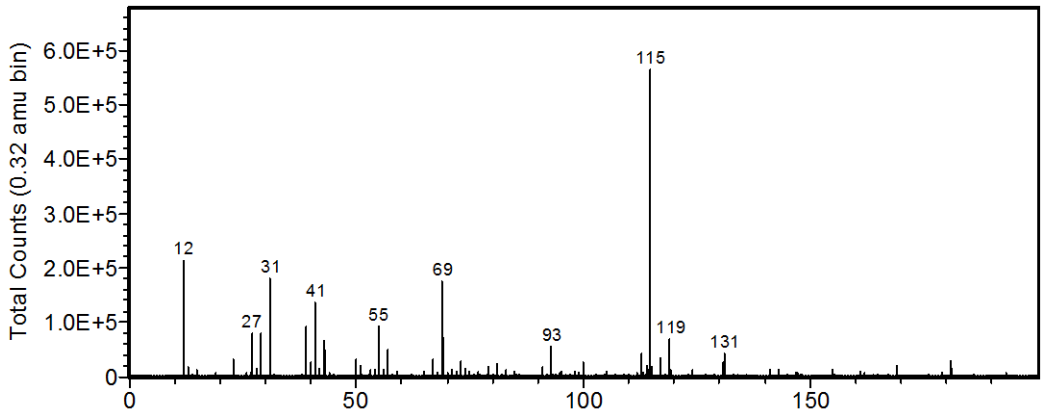



*Figure 1.* ToF-SIMS positive mode images and spectrum recorded of PFOpp coated particles (Scale = 100µm).