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# Attenuation of Encrustation by Self-Assembled Inorganic Fullerene-like Nanoparticles

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## Supplementary Information

### Supplementary figures

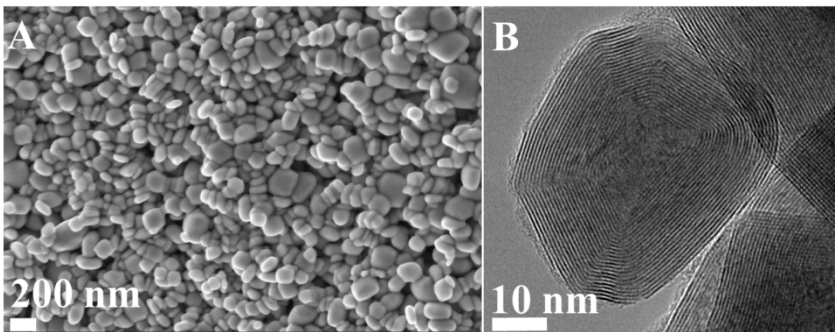


**Fig. S1** Electron microscopy imaging of rhenium-doped inorganic fullerene-like $MoS_2$ nanoparticles; (**A**) SEM micrograph of Re:IF-$MoS_2$ powder. (**B**) TEM micrograph of an individual Re:IF-$MoS_2$ nanoparticle.

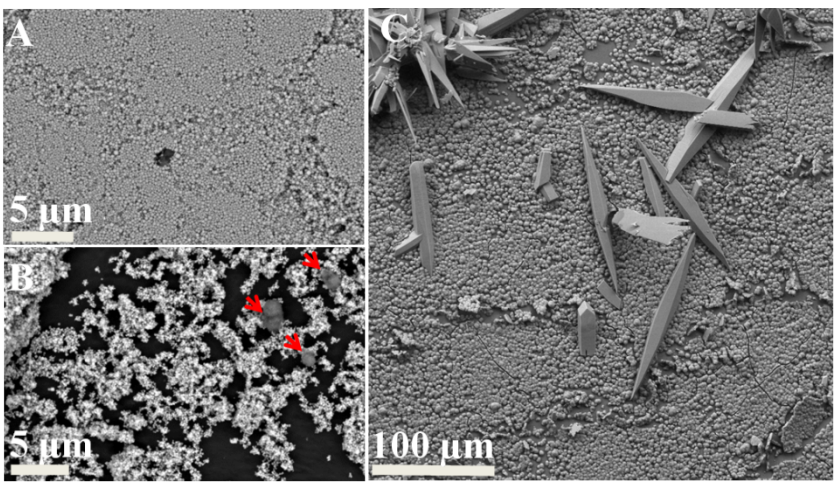


**Fig. S2** SEM (BSE mode) micrographs of encrusted, Re:IF-$MoS_2$-coated and uncoated, catheters (both were jointly incubated in the same bath). (**A**) Surface of a Re:IF-$MoS_2$-coated catheter. Encrustation concretions are minor. The imaged domain of the Re:IF-$MoS_2$ nanoparticles coating displays the closed-pack mosaic-like arrangement of the Re:IF-$MoS_2$ nanoparticles (mode 1). (**B**) Another imaged coating domain (BSE mode of the SEM) on the same Re:IF-$MoS_2$-coated catheter surface as in (**A**). Encrustation concretions (red arrows) are clearly distinguished by their darker appearance in comparison to the Re:IF-$MoS_2$ nanoparticles. The coating domain here contains rather clumped nanoparticles (mode 2). (**C**) Surface of an uncoated catheter. Encrustation precipitates cover most of the surface by both the elongated and globular encrustive stones.

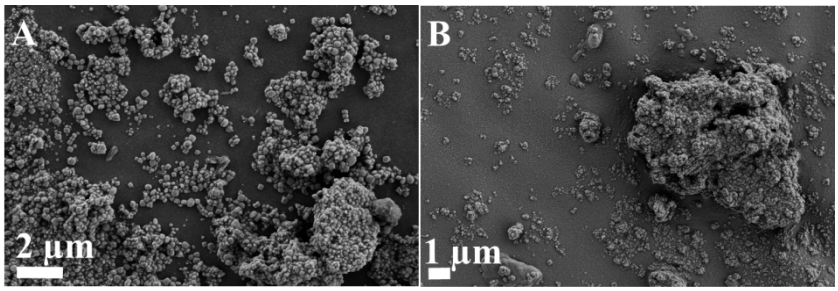


**Fig. S3** SEM micrographs of Re-doped and undoped IF-$MoS_2$ nanoparticles. (**A**) A clumped (mode 2) packing of the Re:IF-$MoS_2$ coating on the surface of a silicone catheter. (**B**) Typical undoped IF-$MoS_2$ coating on the silicone catheter.

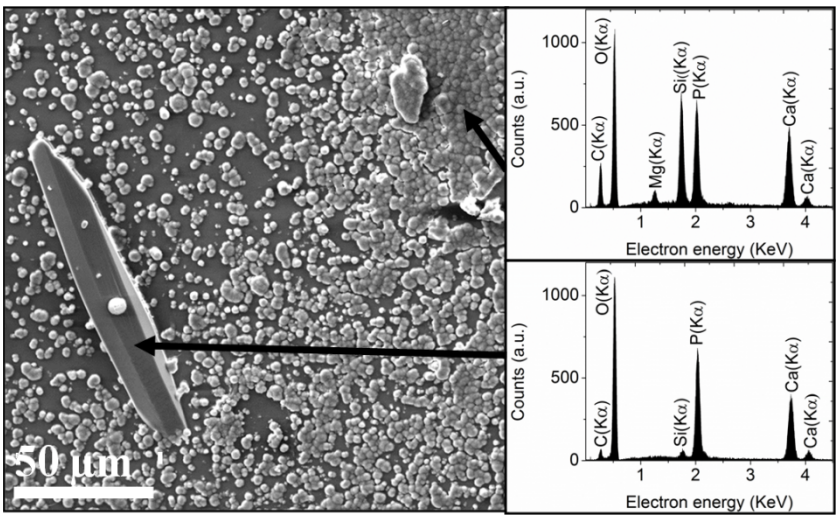


**Fig. S4** EDS spectra of the two *in-vitro* encrustation morphologies. The arrows are directed to the adequate deposit`s morphology on the SEM micrograph, from which the spectra were generated.

## Supplementary table

**Table S1** The composition of the synthetic urine.

| Compound | Chemical formula | Concentration [g/L] |
|---|---|---|
| Calcium chloride | $CaCl_2 \cdot 2H_2O$ | 0.49 |
| Magnesium chloride hexahydrate | $MgCl_2 \cdot 6H_2O$ | 0.65 |
| Sodium chloride | NaCl | 4.6 |
| Di-sodium sulphate | $Na_2SO_4$ | 2.3 |
| Tri-sodium citrate dihydrate | $HOC(COONa)(CH_2COONa)_2 \cdot 2H_2O$ | 0.65 |
| Di-sodium oxalate | $Na_2C_2O_4$ | 0.02 |
| Potassium dihydrogen phosphate | $KH_2PO_4$ | 2.8 |
| Potassium chloride | KCl | 1.6 |
| Ammonium chloride | $NH_4Cl$ | 1.0 |
| Urea | $NH_2\text{-}CO\text{-}NH_2$ | 25 |