Electronic Supplementary Material (ESI) for Materials Chemistry Frontiers.

Supporting information

Title: 3D printed composites from heat extruded polycaprolactone / sodium alginate filaments and their heavy metal adsorption properties

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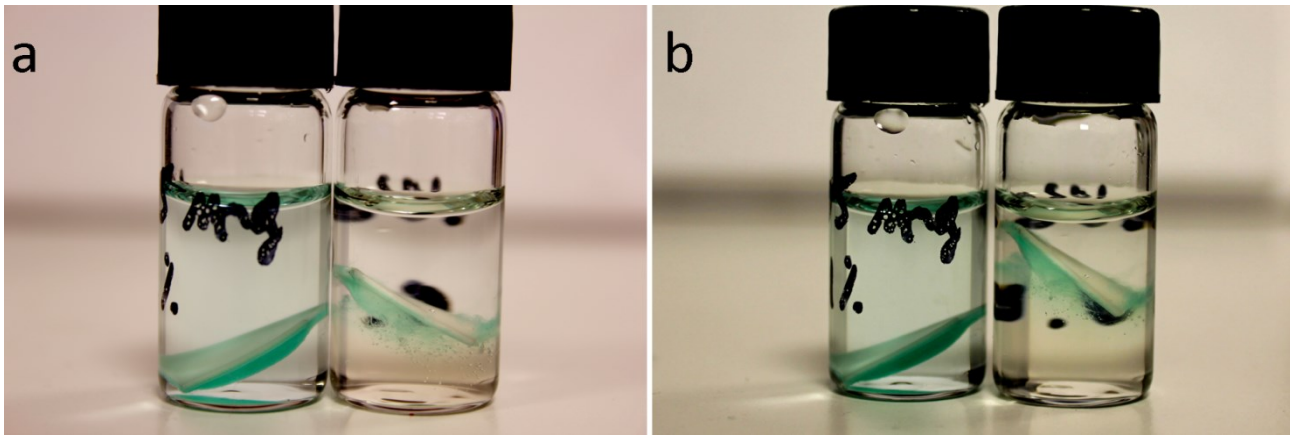

Figure S1. (a) PCL/30%SA film immersed for 6 h in 1% (left vial) and 0.17% w/w (right vial) Cu_2SO_4 solution and (b) PCL/30%SA film immersed for 1 day in 1% (left vial) and 0.17% w/w (right vial) Cu_2SO_4 solution.

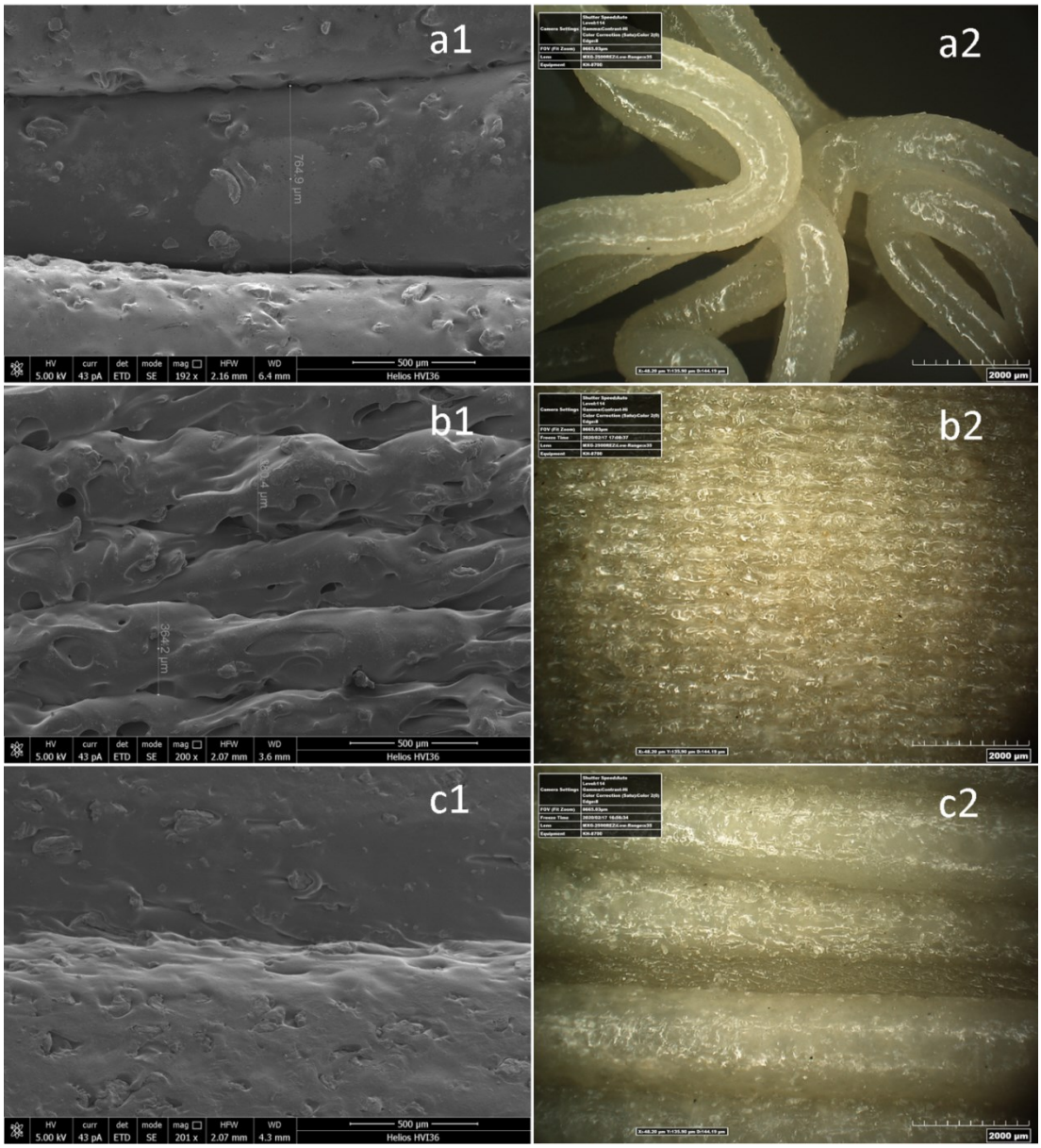

Figure S2. SEM and optical microscopy images of 3D printed objects using PCL/15%SA feeding filament for (a1 & a2) 3D pen; (b1 & b2) FDM 3D printer and (c1 & c2) growing robot respectively.

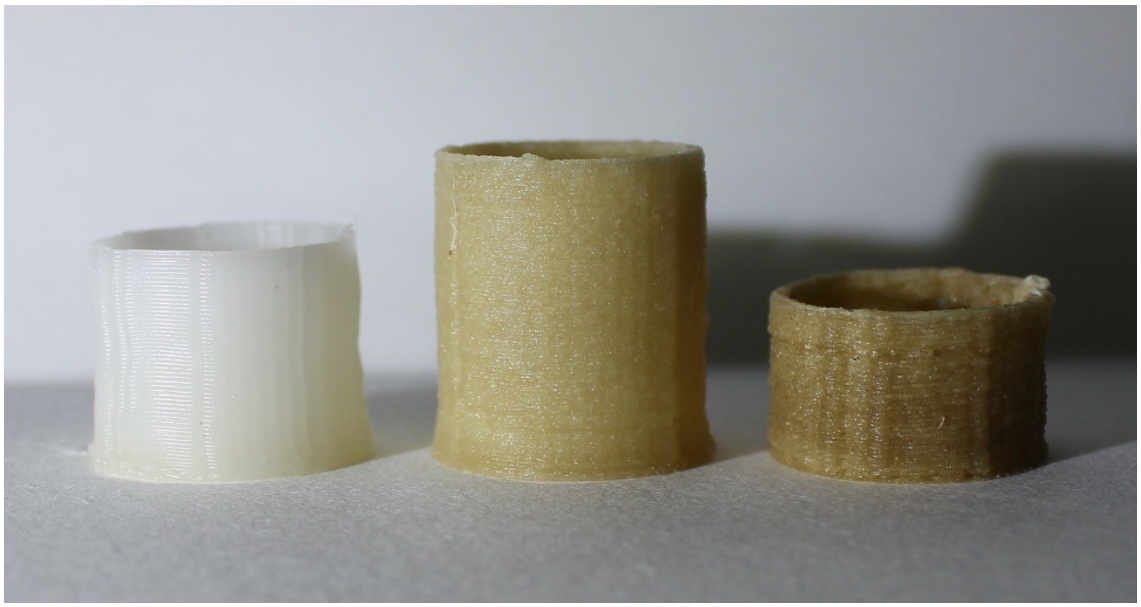

Figure S3. From left to right PCL/5, 15 & 30%SA FDM 3D printed tubes.

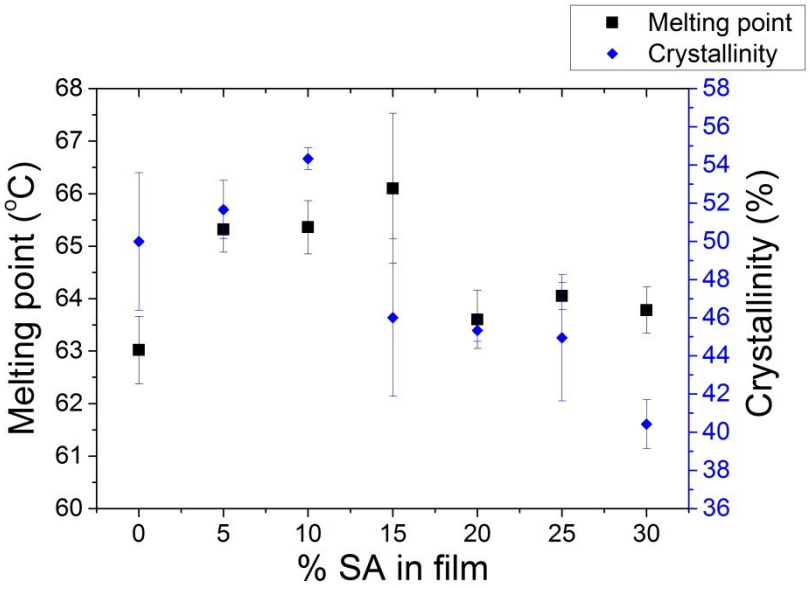

Figure S4. Melting point and % crystallinity of PCL/SA films

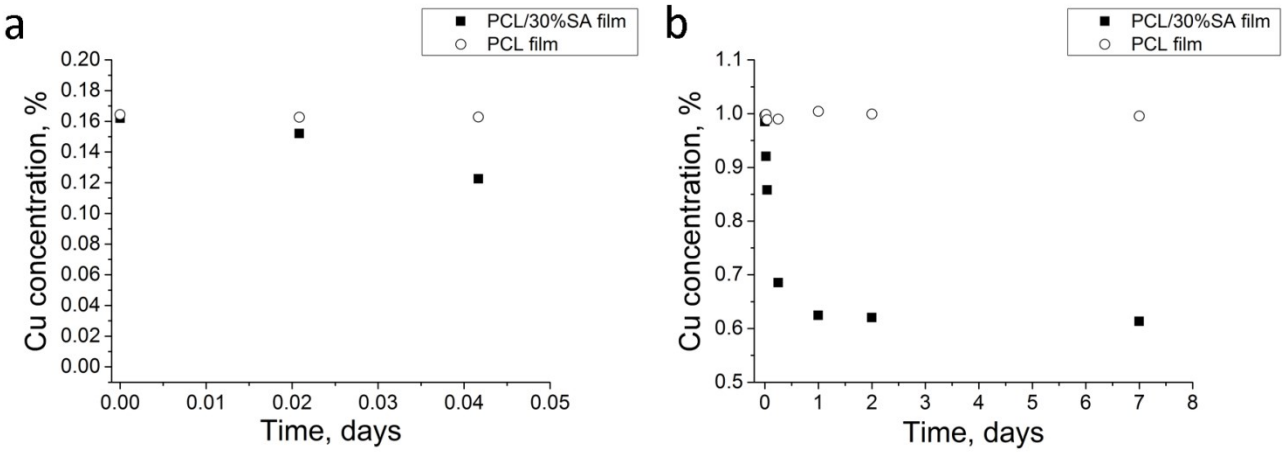

Figure S5. Kinetics of % concentration of Cu_2SO_4 vs immersion time of PCL/30%SA film in (a) 3 ml of 0.17% w/w Cu_2SO_4 solution and (b) in 3 mL of 1% w/w Cu_2SO_4 solution.

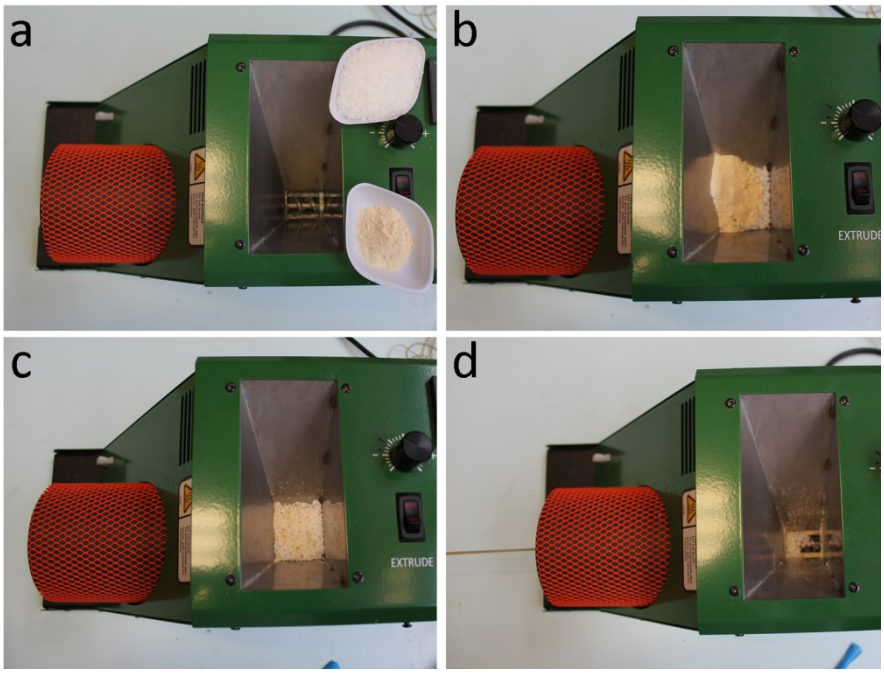

Figure S6. (a-c) Directly mixing PCL pellets with SA powder in the heat extruder and (d) filament extruded from the PCL and SA mixing.

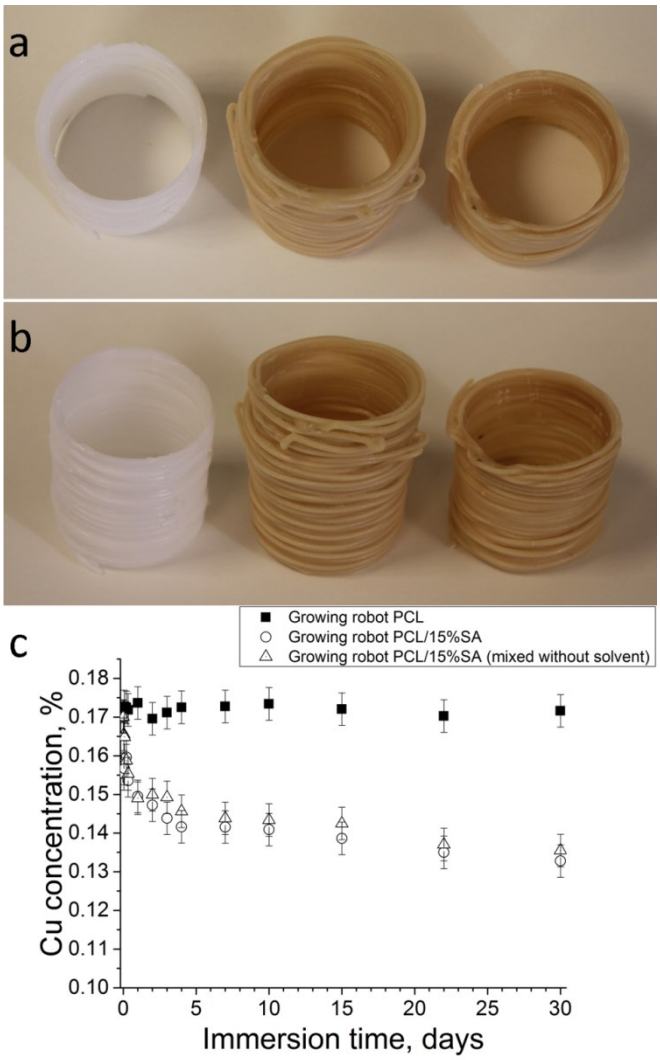

Figure S7. (a, b) Photographs of 3D Growing robot printed structures of PCL, PCL/15%SA and PCL/15%SA (originated from a filament made without the use of DCM solvent) from left to right; and (c) % of Cu concentration reduction of the above 3D Growing robot printed structures (100 mg) in 6 mL of 0.17% w/w Cu_2SO_4 solution. (The misaligned layers on the top of the PCL/15%SA structures (a and b) where due to the change printing direction to obtain a starting curve).