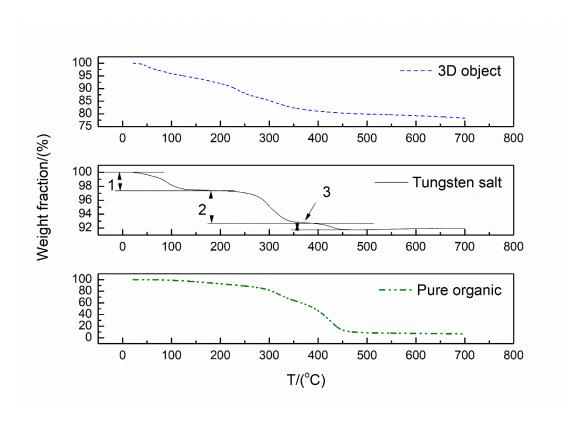
## High complexity WO<sub>3</sub>-based catalyst with multi-catalytic species via 3D printing

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SUPPLEMENTARY MATERIAL



**Figure S1.** Thermogravimetric analysis of tungsten salt, ammonium metatungstate hydrate, dried 3D object, and pure organic without salt, which was fabricated in the same route as that for the 3D object.

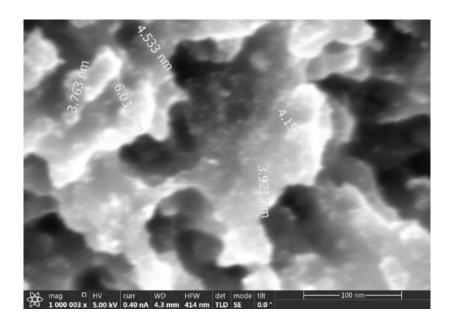
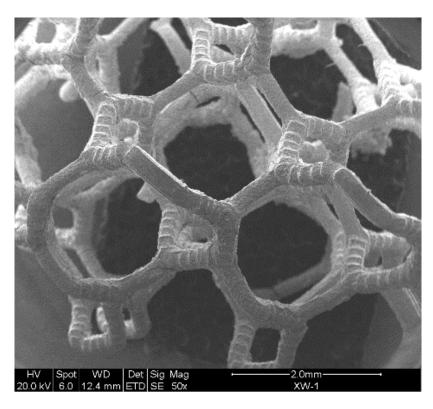
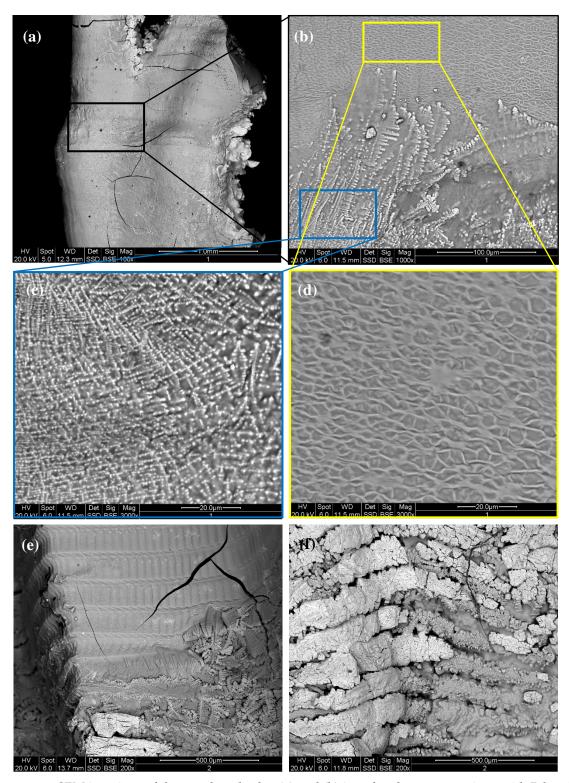


Figure S2. The particles of platinum oxide in the obtained catalyst, which is nano-sized.



**Figure S3.** SEM imagines of pyrolyzed object.



**Figure S4.** SEM imagines of the pyrolyzed tube. (a) and (b) interface between sections with Pd and Rh; (c) the section with Rh; (d) the section with Rh; (e) interface between sections with Pt and Rh; (f) the section with Pt, which is similar to that shown in Fig. 2.