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Supplementary Information

Porous Metal-Organic Gel Assisted by L-Tartaric Acid Ligand for Efficient and Controllable Drug Delivery

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Materials and Characterization

Ethanol, monopotassium phosphate, dipotassium phosphate, L-tartaric acid and $AlCl_3 \cdot 6H_2O$ were purchased from Tianjing zhiyuan chemical reagent Co.,Ltd. (Tianjing, China). Methyl salicylate (MS) was used as received from chemical suppliers (Aldrich). All solvents and reagents were analytical grade and used without further purification. Fourier transform infrared (FTIR) spectra were performed on a Spectrum 100. All of samples were measured by using KBr pellets and analyze in a range of 400 to 4000 cm^{-1} with 16 scans at a resolution of 2 cm^{-1}. X-ray powder diffraction (XRD) patterns were recorded on a Bruker D8 X-ray diffractometer. The powders of the gels were studied operating at an accelerating voltage of 40 kV with intensity of 40 mA. Scanning electron microscopy (SEM) micrographs equipped with an energy dispersive X-ray (EDX) detector. Brunauer-Emmett-Teller (BET) was carried out using an Autosorb-iQ_2. Thermogravimetric analyses (TGA) were conducted on a TGA/SDTA851e. X-ray photoelectron spectroscopy (XPS) experiments were conducted using a Kratos AXIS ULTRA DLD apparatus, UV-3010 spectrophotometer were used to determine the released. Dynamic rheological and viscosity measurements were performed using an Anton Paar Physica Gemini200. The gap in the setup for rheological testing of the gels was 30 μm and experiments were conducted at 37 °C. Strain sweep tests were performed with increasing amplitude oscillation up to 100 % apparent strain on shear. The frequency range is chosen 0.1-10 rad s^{-1}. An oscillatory frequency of 1 Hz was used at all times.

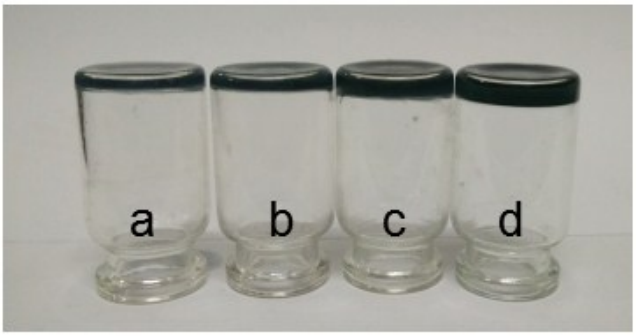
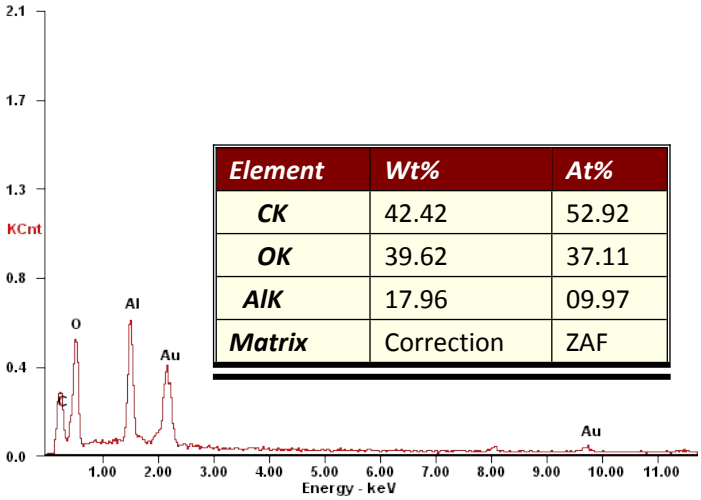


Fig. S1. Photograph of the different metal-to-organic ratios Cr-MOG. a, 0.5:1. b, 1:1. c, 1.5:1. d, 2:1.



Element	*Wt%*	*At%*
CK	42.42	52.92
OK	39.62	37.11
AlK	17.96	09.97
Matrix	Correction	ZAF

Fig. S2. EDX spectrum of the Al-MOG.

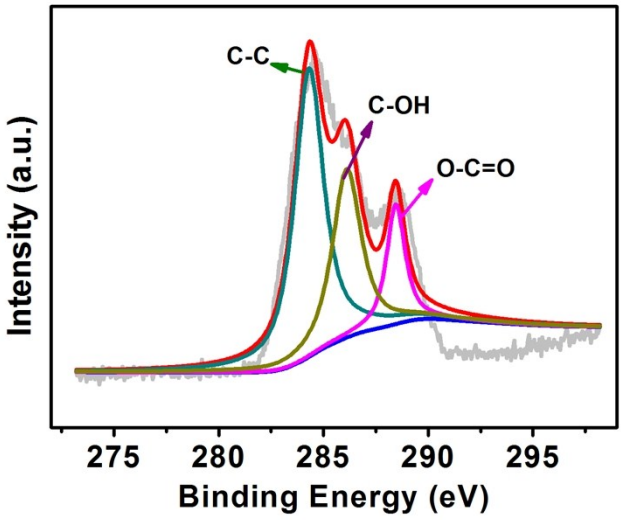


Fig. S3. High-Resolution XPS analyses of C 1s.

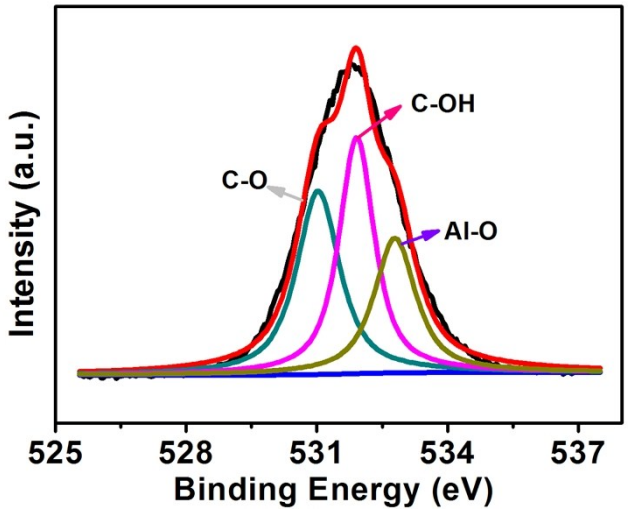


Fig. S4. High-Resolution XPS analyses of O 1s.

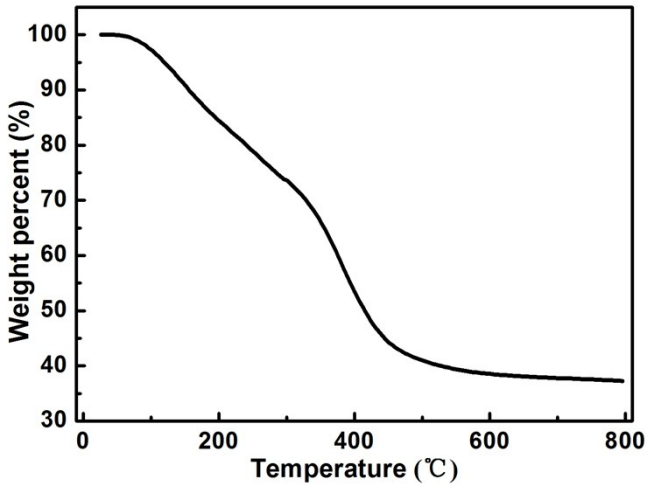


Fig. S5. TGA curves of Al-MOG.

Fig. S6. The Al-MOG was stable in NaCl solution (10 mM) for about 12 h.

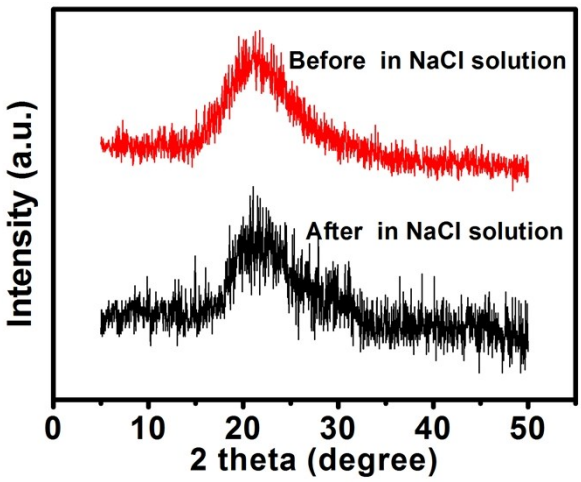


Fig. S7. The XRD patterns of the Al-MOG before and after in NaCl solution for about 12 h.

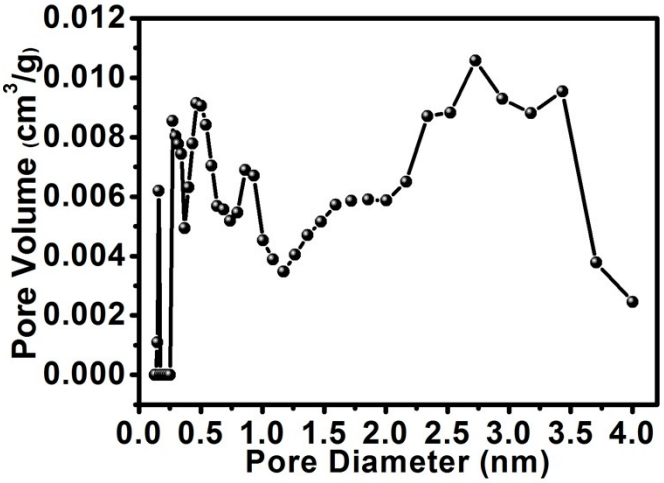


Fig. S8. Pore distribution of the X-Al-MOG.

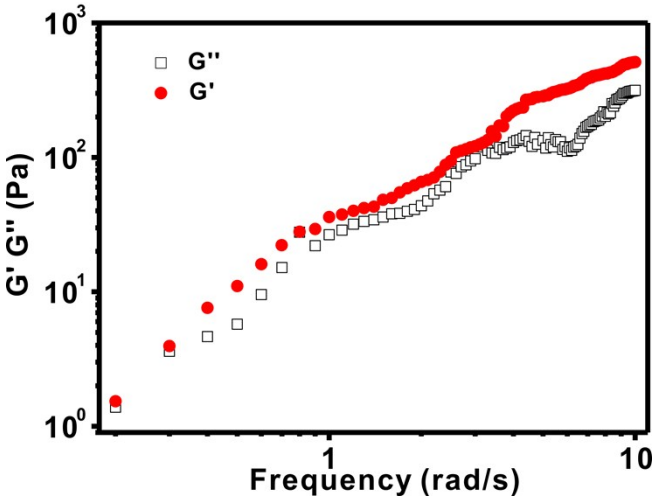


Fig. S9. Variation of storage modulus (G') and loss modulus (G") with frequency for the Al-MOG.

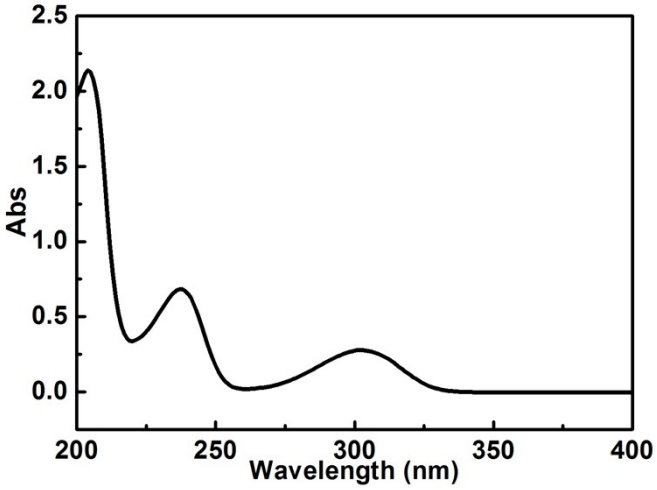


Fig. S10. The UV absorption spectrum of MS.

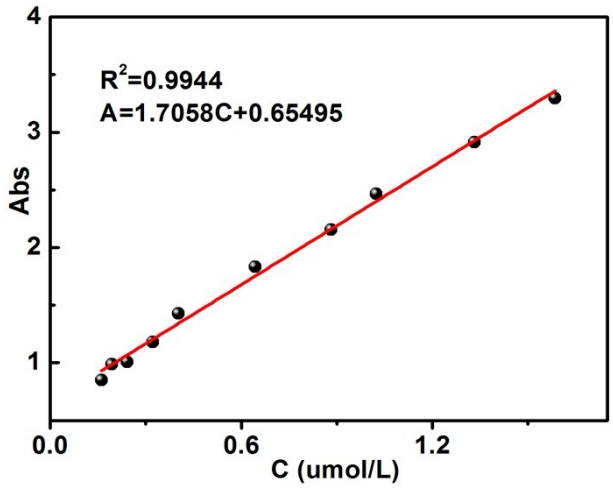


Fig. S11. The standard curve of MS.

Table S1 Metal-Organic gel tests of $AlCl_3 \cdot 6H_2O$ and L-tartaric acid in various temperature.

Solvent	EtOH	EtOH	EtOH	EtOH	EtOH	EtOH	EtOH
Temperture (℃)	80	90	100	110	120	125	130
Al: L-tartaric acid (mole ratio)	2:1	2:1	2:1	2:1	2:1	2:1	2:1
Time (h)	48	48	48	48	48	48	48
Results	solution	solution	solution	weak gel	gel	gel	sticky solution

Table S2 Metal-Organic gel tests of $AlCl_3 \cdot 6H_2O$ and L-tartaric acid in various metal-to-organic ratio at 120 ℃.

Solvent	EtOH	EtOH	EtOH	EtOH	EtOH	EtOH
Al: L-tartaric acid (mole ratio)	0.5:1	0.67:1	1:1	1.5:1	2:1	2.5:1
Time (h)	48	48	48	48	48	36
Results	turbid liquid	turbid liquid	weak gel	weak gel	gel	gel

Table S3 Metal-Organic gel tests of $AlCl_3 \cdot 6H_2O$ and L-tartaric acid in various solvents at 120 ℃.

Solvent	H_2O	H_2O /EtOH	H_2O/ MeOH	DMF	MeOH	MeOH/ EtOH	EtOH
Al: L-tartaric acid (mole ratio)	2:1	2:1	2:1	2:1	2:1	2:1	2:1
Time (h)	48	48	48	48	48	48	48
Results	solution	solution	solution	solution	gel	gel	gel

Table S4 Metal-Organic gel tests of $Cr(NO_3)_3 \cdot 9H_2O$ and L-tartaric acid in various metal-to-organic ratios at 120 ℃.

Solvent	EtOH	EtOH	EtOH	EtOH
Cr: L-tartaric acid (mole ratio)	0.5:1	1:1	1.5:1	2:1
Time (h)	48	48	48	48
Results	gel	gel	gel	gel