

Effective adsorption of In(III) from hydrochloric acid solution using hyperbranched polyethyleneimine and sodium chloroacetate modified weakly acidic macroporous resin

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1. Determination of the anion exchange capacity of HPEI-HD-1

Take 0.25 g of HPEI-HD-1 into a flask and add 30mL of 0.1 mol/L HCl solution. Then the mixture was placed at 40 °C for 6 h. After the reaction, 10 mL of filtrate was taken and titrated with 0.1 mol/L NaOH solution using phenolphthalein as indicator. The anion exchange capacity (IEC, mmol/g) of the HPEI-HD-1 was calculated using the following Equation (S1).

$$\text{IEC} = \frac{3(10 \times C_{\text{HCl}} - C_{\text{NaOH}} V_{\text{NaOH}})}{m} \quad (\text{S1})$$

Where, C_{NaOH} and C_{HCl} are the concentration of NaOH solution and HCl solution, respectively, mol/L; V_{NaOH} is the volume of NaOH solution used for the measured filtrate, respectively, mL; m is adsorbent mass, g.

2. Determination of the cation exchange capacity of CM-HPEI-HD-1

0.5g of CM-HPEI-HD-1 and 30 mL of 0.1 mol/L NaOH solution were placed in a flask, and then reacted at 40 °C for 6 h. After the reaction, 10 mL of filtrate was taken and

titrated with 0.1 mol/L HCl solution using methyl orange as indicator. The cation exchange capacity (IEC, mmol/g) of the CM-HPEI-HD-1 was calculated using the following equation (S2).

$$\text{IEC} = \frac{3(10 \times C_{\text{NaOH}} - C_{\text{HCl}} V_{\text{HCl}})}{m} \quad (\text{S2})$$

Where, C_{NaOH} and C_{HCl} are the concentration of NaOH solution and HCl solution, respectively, mol/L; V_{HCl} is the volume of HCl solution used for the measured filtrate, respectively, mL; m is adsorbent mass, g.

Table S1 The ion exchange capacity of HPEI-HD-1 and CM- HPEI-HD-1.

Sample	IEC (mmol/L)
HPEI-HD-1	4.29
CM-HPEI-HD-1	1.82

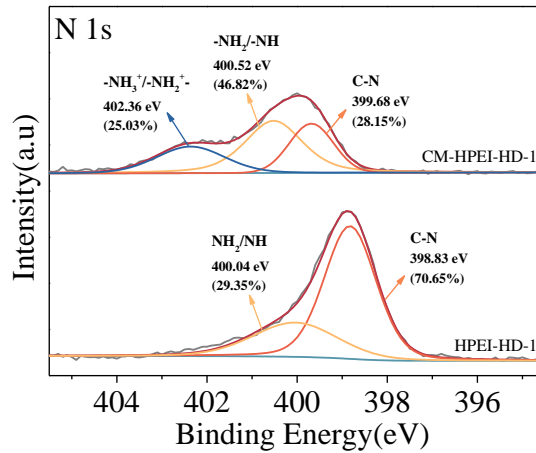


Fig. S1. N 1s spectra of adsorbents.