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# Effective Isolation of Succinic Acid from Aqueous Media with the Use of Anion Exchange Resins

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# SUPPORTING INFORMATION

**Table S1.** The general properties of anion exchange resins used in the study.

| General properties | Lewatit MP-62 | Lewatit MP-64 | Lewatit M-500 | Lewatit M-600 |
|---|---|---|---|---|
| Type | weak basic | weak basic | strong basic | strong basic |
| Ionic form | free base | free base | $Cl^-$ | $Cl^-$ |
| Functional group | tertiary amine | tertiary & quaternary amine | quaternary amine (Type I) | quaternary amine (Type II) |
| Matrix structure | cross-linked polystyrene | cross-linked polystyrene | cross-linked polystyrene | cross-linked polystyrene |
| Appearance | beige, opaque | beige, opaque | yellow, translucent | white, translucent |
| Maximum temperature (°C) | 130 | 70 | 70 | 30 |
| Operating pH range | 0-8 | 0-7 | 0-12 | 0-11 |
| Density (g/mL) | 1.02 | 1.04 | 1.08 | 1.10 |
| Total capacity (eq/L) | 1.7 | 1.3 | 1.3 | 1.3 |

**Table S2.** Non-linear and linear equations of the kinetic models studied.

| Kinetic model | Non-linear equation | Linear equation | Plot |
|---|---|---|---|
| Pseudo-first-order | $dq_t/dt = k_1 \cdot (q_e - q_t)$ | $\log (q_e - q_t) = \log q_e$ | log (qe-qt) *vs* t |
| Pseudo-second-order | $dq_t/dt = k_2 \cdot (q_e - q_t)$ | $\frac{t}{q_t} = \frac{1}{k_2 q_e^2} + \frac{1}{q_e} \cdot t$ | $t/q_t$ *vs* t |
| Elovich | $dq_t/dt = \alpha \cdot exp$ | $q_t = \frac{\ln (\alpha \cdot \beta)}{\beta} + \frac{\ln t}{\beta}$ | $q_t$ *vs* ln t |
| Intraparticle diffusion | --- | $q_t = k_{id} \cdot t^{0.5} + I$ | $q_t$ *vs* $t^{0.5}$ |

**Table S3.** The linear equations of the isotherm models studied.

| Model name | Linear equation | Plot |
|---|---|---|
| Langmuir | $\frac{1}{q_e} = \frac{1}{q_{max} K_L} \cdot \frac{1}{C_e} + \frac{1}{q_{max}}$ <br> $R_L = {}^{1}/(1 + (K_L \cdot C_o))$ | $1/q_e$ *vs* $1/C_e$ |
| Freundlich | $\log q_e = \frac{1}{n} \cdot \log C_e + \log K$ | $\log q_e$ *vs* $\log C_e$ |
| Temkin | $q_e = B \cdot \ln K_T + B \cdot \ln C$ | $q_e$ *vs* $\ln C_e$ |
| Scatchard | $\frac{q_e}{C_e} = q_{max} \cdot K_S - K_S \cdot q_e$ | $q_e/C_e$ *vs* $q_e$ |

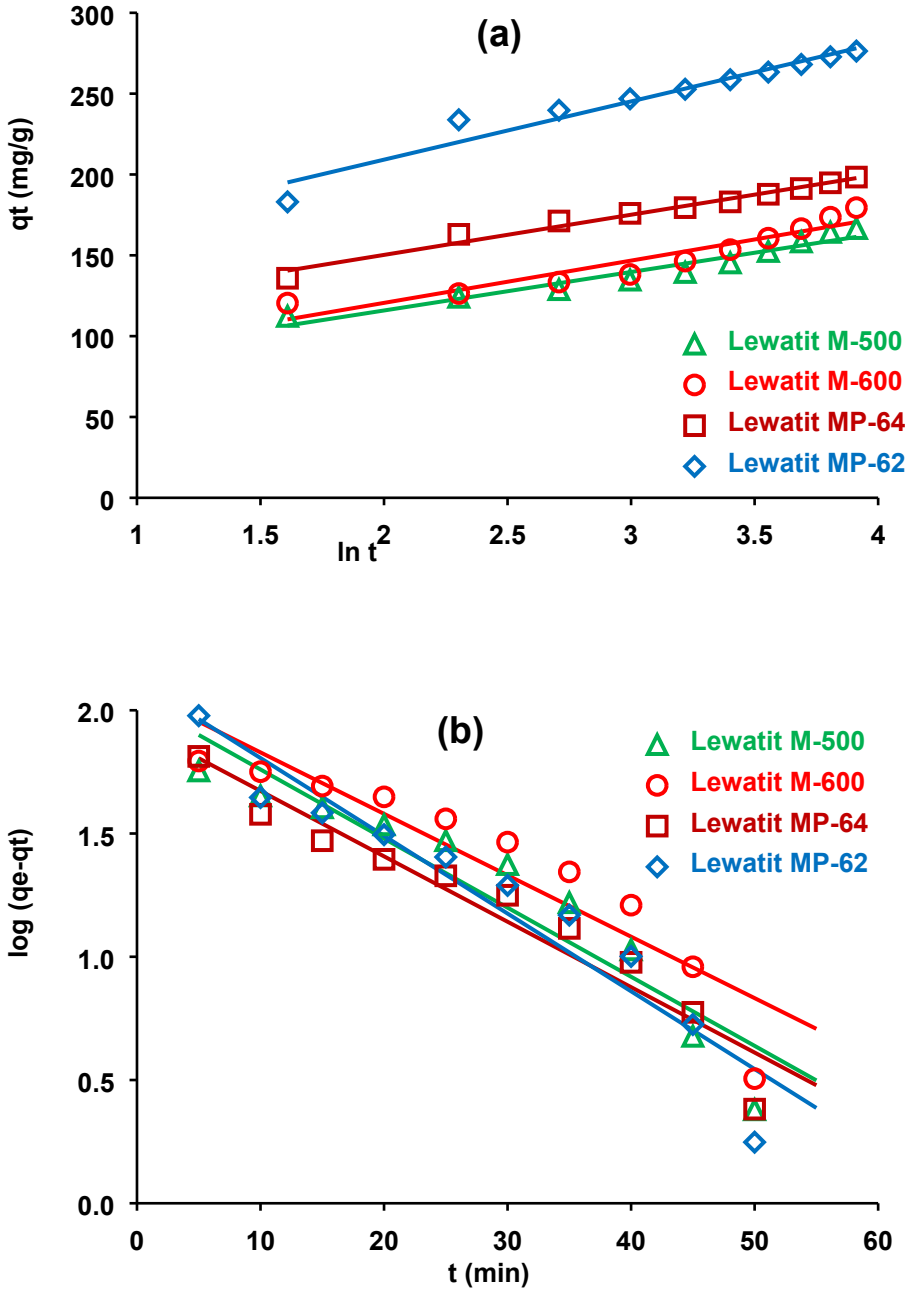


**Fig. S1** The plots of the kinetic analysis for the isolation of SA using anion exchange resins a) Elovich kinetic model b) Pseudo-first order kinetic model