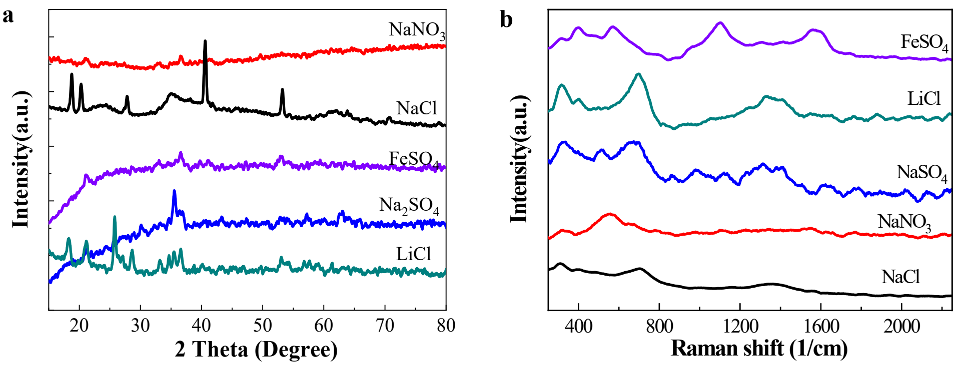

Figure S1 Characterization of precipitates in different solutions a. XRD images b. Raman Spectrum.

Ultrasonic oscillation

Assuming that the radius of the cavitation bubble at the solid/liquid interface is R, the radius of the boundary layer renewal surface R1 caused by it is:

$$R_1 = \sqrt{R^2 - (R - \delta)^2} = \sqrt{2R\delta - \delta^2} \tag{19}$$

The updated area S of the solid-liquid contact surface is

$$S = 2\pi \cdot \sqrt{2R\delta - \delta^2} \cdot \delta \tag{20}$$

According to the Noltingk-Napparis equation and Minneart's equation the maximum and minimum radii of cavitation bubbles in the ultrasonic field at an acoustic pressure of P1 are:

$$R_{max} + \frac{2\sigma}{P_1} R_{min}^{\ 2} = \frac{32\sigma^3}{27P_0(P_0 - P_1)^2} \tag{21}$$

$$\rho\omega^2 R_{max}^{\ 2} = 3\upsilon(P_1 - \frac{2\sigma}{R_{max}}) \tag{22}$$

σ is the surface tension of the liquid (N/m), P_0 is the static pressure of the liquid (Pa); ν is the kinematic viscosity of the liquid (N-s/m^2).

The number of cavitation bubbles generated per unit time can be calculated from the following equation:

$$N = \frac{Af}{2}(\frac{1}{R_{min}^{\ 2}} - \frac{1}{R_{max}^{\ 2}}) \tag{23}$$

A is a dimensionless empirical constant and f is the ultrasound frequency.

The total area Sn of the solid/liquid interface renewed in one cavitation bubble cycle period t is:

$$S_n = SNT = 2\pi \cdot \sqrt{2R\delta - \delta^2} \cdot \delta \cdot \frac{Af}{2}\left(\frac{1}{R_{min}^{2}} - \frac{1}{R_{max}^{2}}\right) \cdot t \tag{24}$$