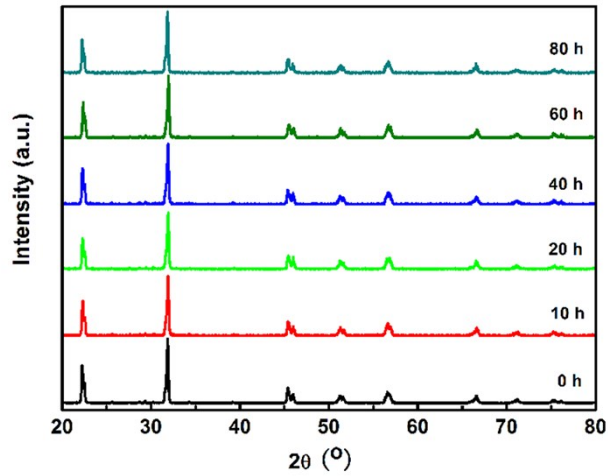


**Fig. 1S** SEM images of the representative sample with  $x=0.010$  at different sintering temperature.

In Fig. 1S, with increasing the sintered temperature, the microstructure of sample becomes more and more dense, and the grains are becoming well-grown. As the sintered temperature reaches 1130~1150 °C, the sample exhibits the optimized microstructure, the average grain sizes is about 1.5~2.3  $\mu\text{m}$ . Further increasing the temperature, the sample seem to be oversintered and melted.



**Fig. 2S** XRD patterns of KNSNZ<sub>x</sub> (x=0.01) sample with various immersion times.

the phase structure stability before and after water immersion was measured by testing the XRD patterns, as shown in Fig. 2S, the results show that phase structure is not changed after and before water immersion, indicating the phase structure stability of KNN/Sm/Zr samples.