Electronic Supplementary Material (ESI) for Reaction Chemistry & Engineering.

Optical monitoring of the anodic dissolution of zirconium and the agglomeration of potassium hexachlorozirconate during transpassive dissolution in molten LiCl–KCl salt

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Electronic Supplementary Information

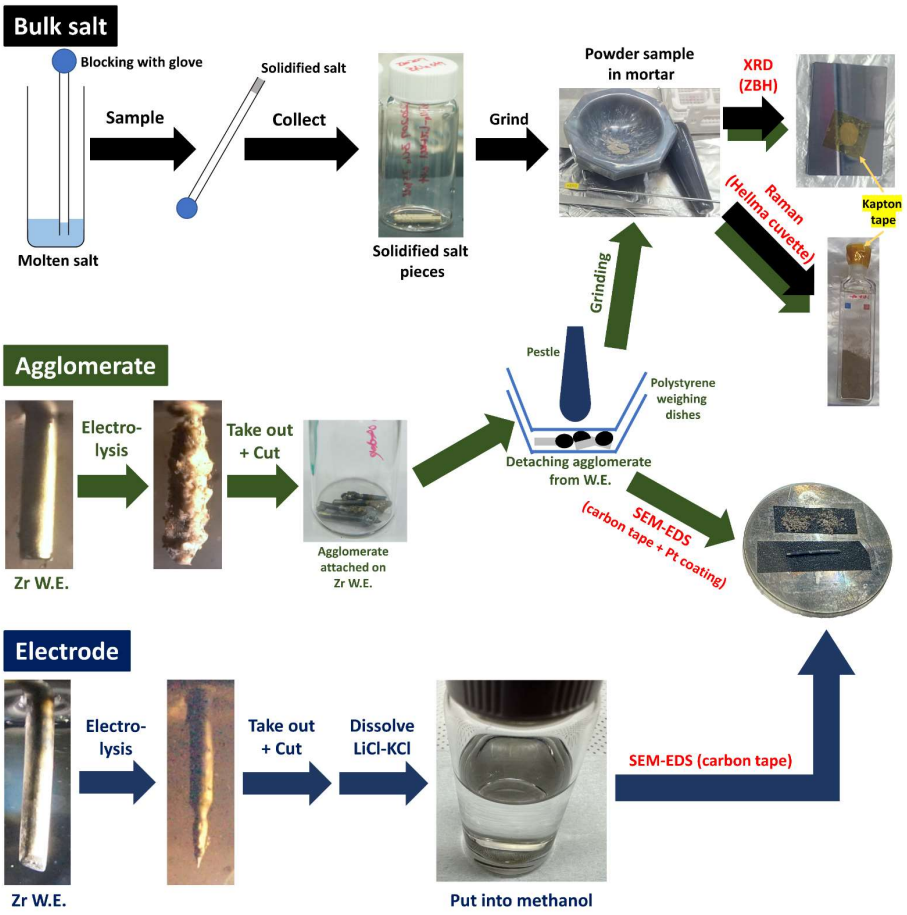

Fig. S1. Summary flowchart for preparing analytical specimens of each type of product obtained from experiments in the molten LiCl–KCl salt system.

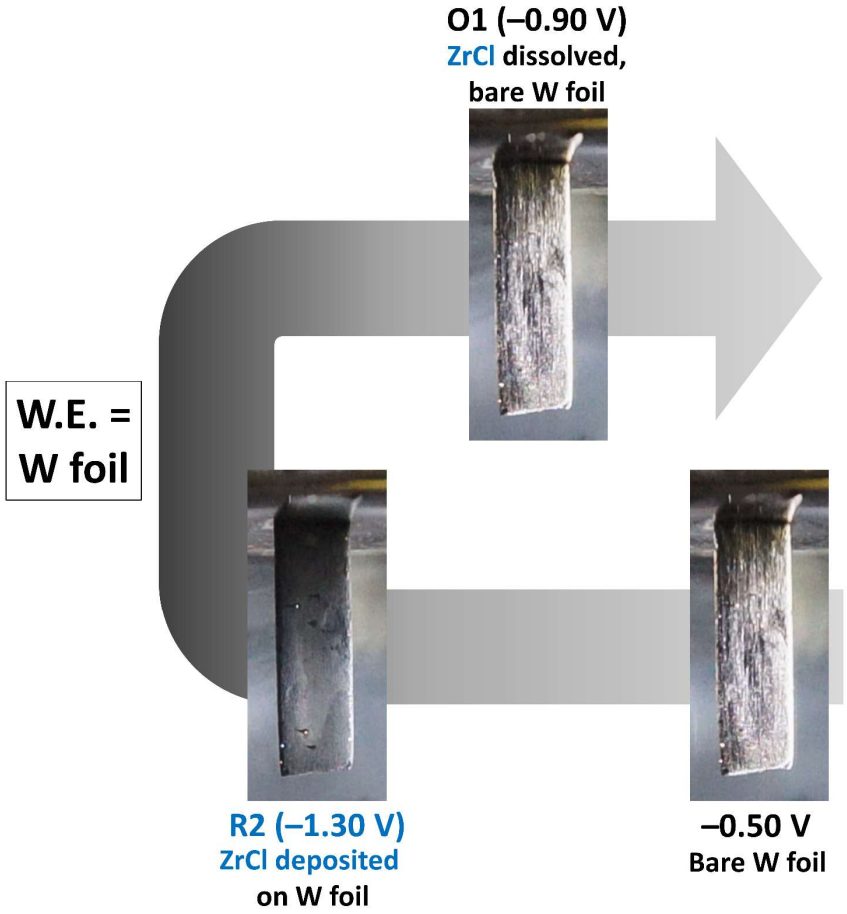

Fig. S2. Images captured by the optical monitoring system during the cyclic-voltammetry experiments (–1.45 V to +0.20 V vs. Ag|AgCl 10 wt%, scan rate = 100 mV/s), using inert tungsten foil as the working electrode in the $ZrCl_4$–LiCl–KCl ([$ZrCl_4$] = 1.0 wt%) system. See the authors' previous work[S1] for more information on CV with a tungsten working electrode.

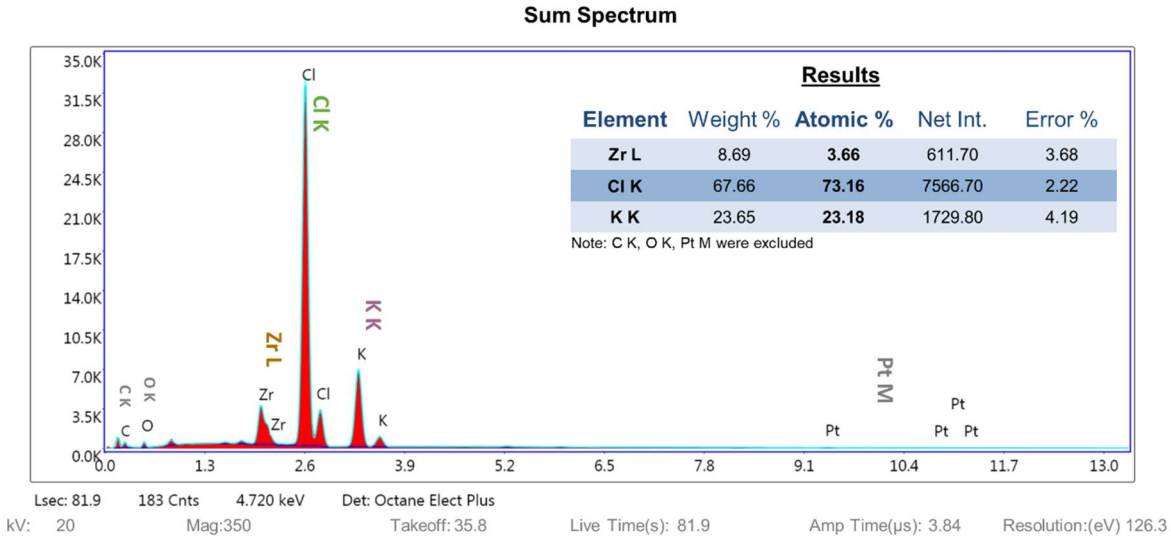

Fig. S3. Elemental analysis results of the area-scan EDS spectrum of **Fig. 7** (O4 agglomerate).

Video captions

Movie S1 is a real-time optical monitoring result showing the visual changes on the Zr electrode for about 45 seconds from the start of the chronoamperometric anodic dissolution experiment at O4 (0.00 V).

Movie S2 shows the results of high-resolution optical monitoring of the Zr electrode about 3 minutes after the initiation of chronoamperometric anodic dissolution at O4 (0.00 V). It includes the evolution of gas bubbles, the formation of the agglomerate, and the “eruption” of solid substances onto the electrode surface.

Reference

[S1] H. L. Cha and J.-I. Yun, *J. Electrochem. Soc.*, 2023, **170**, 022509.