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Correction

Correction: Zhu et al. Hydrogel Polymer Electrolytes for Aqueous Zinc-Ion Batteries: Recent Progress and Remaining Challenges. *Batteries* 2025, *11*, 380

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Error in Figure and Table

In the original publication [1], there was a mistake in Figure 4b and legend and Table 1 as published. The corrected Figure 4 and legend and Table 1 appears below.

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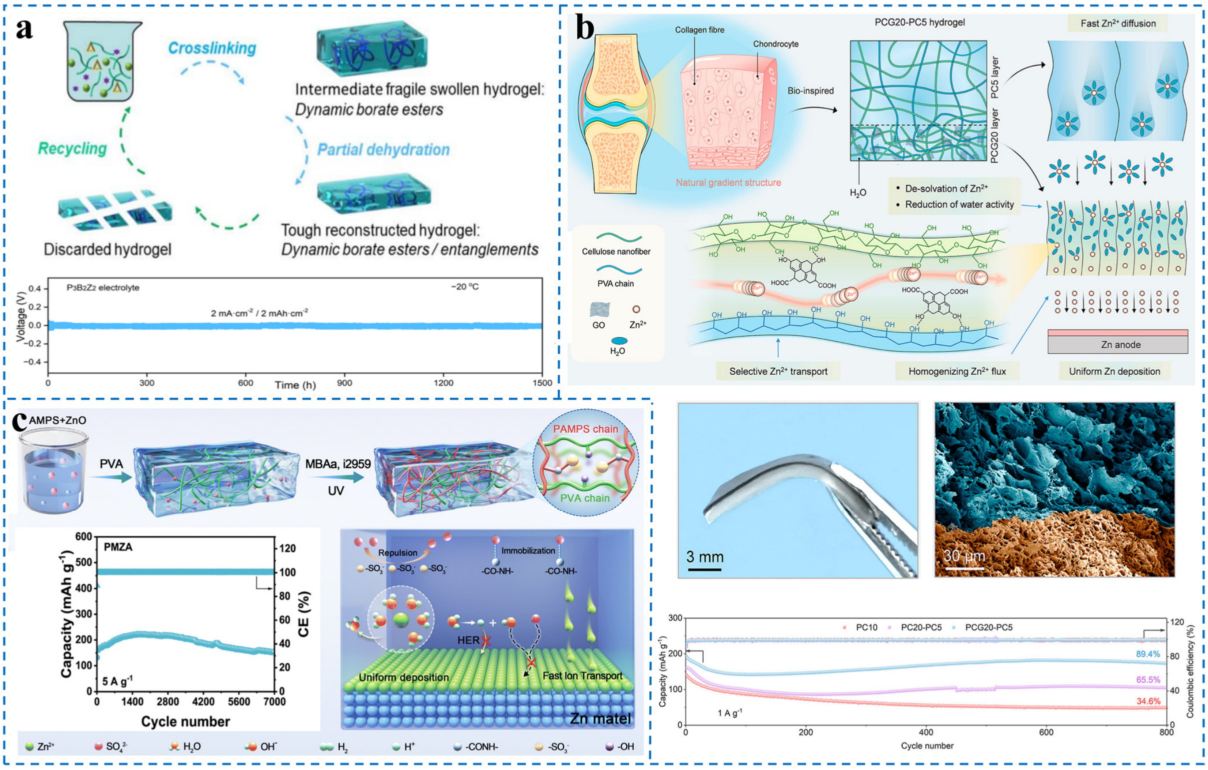

Figure 4. Representative structural and functional enhancements to PVA-based hydrogels. (**a**) Schematic illustration of the synthesis of P3B2Zx hydrogels and the Zn plating/stripping performance of a symmetric cell with the P3B2Z2 electrolyte at 2 mA cm^{-2} at −20 °C [108]. (**b**) Schematic illustration of the cartilage-inspired gradient-networked hydrogel electrolyte designed to stabilize the Zn anode, a photograph and SEM image of the as-prepared PCG20–PC5 hydrogel, and the long-term cycling performance of coin-type Zn-ion batteries employing various hydrogel electrolytes [110]. (**c**) Schematic of PMZA synthesis, hydrogel electrolyte mechanism, and Zn | PMZA | NVO full-cell cycling performance at 5 A g^{-1} [114].

Table 1. Representative hydrogel polymer electrolytes for aqueous ZIBs reported in the literature.

Electrolyte	Tensile Strength (MPa)	Fracture Strain (%)	Ionic Conductivity (mS cm^{-1})	Zn^{2+} Transference Number	Zn		Zn Symmetric Cell (Cycle Time, Current Density/Capacity)	Full Cell Performance (Cathode | | Anode, Cycles, Test Condition, Capacity Retention)	Refs.
PM-HE	0.23	790	60.6	0.88	>1500 h, 1 mA cm^{-2}/ 1 mAh cm^{-2}	Zn		MnO_2, 1000, 5 C, 91.6%	[105]
PAM/trehalose	0.1	5338	-	-	>2400 h, 1 mA cm^{-2}/ 1 mAh cm^{-2}	Zn		MnO_2, 3000, 10 A g^{-1}, 62.7%	[101]
PAM−PAAS −QCS	0.077	5100	33.61	0.72	1400 h, 0.5 mA cm^{-2}/ 0.5 mAh cm^{-2}	Zn		PANI, 1500, 1 A g^{-1}, 82.4%	[106]
PAM/PVA	0.08	1490	6.7	-	500 h, 1 mA cm^{-2}/ 1 mAh cm^{-2}	Zn		$Co_3[Fe(CN)_6]_2$, 300, 1 A g^{-1}, 79.5%	[107]
P3B2Z2	1.1	1455.6	19.4	0.53	>1500 h, 2 mA cm^{-2}/ 2 mAh cm^{-2}	Zn		KVOH, 1500, 5 A g^{-1}, 77.5%	[108]
PVA/borax/ glycerol	0.1	490	29.6	-	>1400 h, 2 mA cm^{-2}/ 2 mAh cm^{-2}	Zn		rGO/MnO_2, 2000, 1 A g^{-1}, ~90%	[109]
PCG20-PC5	0.43	320	16.18	0.45	>2200 h, 1 mA cm^{-2}/ 1 mAh cm^{-2}	Zn		MnO_2, 800, 1 A g^{-1}, 89.6%	[110]
PPZ	-	-	30.1	0.84	1800 h, 0.5 mA cm^{-2}/ 0.5 mAh cm^{-2}	Zn		PANI@TOC, 100, 2 mA cm^{-2}, —	[112]
PMZA	-	-	71.17	0.912	1800 h, 0.5 mA cm^{-2}/ 0.5 mAh cm^{-2}	Zn		NVO, 7000, 5 A g^{-1}, 100%	[114]

Table 1. *Cont.*

Electrolyte	Tensile Strength (MPa)	Fracture Strain (%)	Ionic Conductivity (mS cm^{-1})	Zn^{2+} Transference Number	Zn		Zn Symmetric Cell (Cycle Time, Current Density/Capacity)	Full Cell Performance (Cathode | | Anode, Cycles, Test Condition, Capacity Retention)	Refs.
ATAC/EG/PAA/$Zn(OTF)_2$	0.08	570	7.5	-	-	Zn		CC/Pt/C/RuO2, 127 h, 0.1 mA cm^{-2}, —	[115]
PAA/CNF	0.04	~220	32	-	4600 h, 0.5 mA cm^{-2}/ 0.25 mAh cm^{-2}, at −20 °C	Zn		FeHCF, 3000 h, 4 A g^{-1}, 84.1%	[116]
PAA/Al_2O_3	0.1	~800	186	-	-	Zn		Co_3O_4/C/Ni, 384 h, 2 mA cm^{-2}, —	[117]
DPR/PAA	0.38	1450	23.24	-	>1700 h, 5 mA cm^{-2}/ 5 mAh cm^{-2}	Zn		MnO_2, 1000 h, 3 A g^{-1}, 81.3%	[118]

Text Correction

A correction has been made to Section 3.2. Polyvinyl Alcohol (PVA), Paragraph 3:

Beyond chemical modifications, structural engineering has proven effective for performance enhancement. Wang et al. constructed a gradient-networked hydrogel electrolyte (PCG20-PC5) inspired by the layered structure of articular cartilage. The cathode-facing layer was composed of low-network-density PVA/cellulose nanofiber (PVA/CNF, PC) hydrogel, featuring large pores (15–40 μm) and high water content, which significantly promoted ion transport. Conversely, the anode-facing layer was a high-network-density PVA/CNF/graphene oxide (PCG) hydrogel with smaller pores (3–6 μm) and abundant carboxyl and hydroxyl groups, which facilitated Zn^{2+} desolvation, reduced water activity, and homogenized ion flux (Figure 4b). The introduction of graphene oxide (GO) further augments the dielectric properties and electronegativity of the electrolyte, resulting in an increased Zn^{2+} transference number (0.45) and high ionic conductivity (16.18 mS cm^{-1}). This gradient structure not only optimizes interfacial chemistry but also synergistically enhances the uniformity of zinc deposition and reaction kinetics. As a result, the Zn | | Zn symmetric cell based on this electrolyte exhibits exceptional cycling stability for over 2200 h at 1 mA cm^{-2}. The corresponding Zn-MnO_2 full cell demonstrates superior rate capability over 0.15–3 A g^{-1} and an ultralow capacity decay rate of 0.013% per cycle after 800 cycles, indicating outstanding cycling stability and interfacial compatibility [110]. Wu et al. designed a hierarchical porous structure within a pullulan-reinforced double-network hydrogel (PPZ), using interchain hydrogen bonding to stabilize the network. This system supported symmetric cells cycling for 400 h without performance degradation at a depth of discharge (DOD) of 17.08% [111]. Du et al. introduced PVA-borax hydrogel as an interfacial layer at zinc anode, homogenizing the local electric field but also reducing the corrosion current density to 0.029 mA cm^{-2}, thereby improving surface uniformity and interfacial stability [112].

The authors state that the scientific conclusions are unaffected. This correction was approved by the Academic Editor. The original publication has also been updated.

Reference

1. Zhu, Z.; Xiong, S.; Li, J.; Wang, L.; Tang, X.; Li, L.; Sun, Q.; Shi, Y.; Shao, J. Hydrogel Polymer Electrolytes for Aqueous Zinc-Ion Batteries: Recent Progress and Remaining Challenges. *Batteries* **2025**, *11*, 380. [CrossRef]