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Correction: Advancing energy storage and producing potential with a single source driven semiconducting $BaS_3:Cs_2S:La_2S_3$ chalcogenide prepared *via* a sustainable mode

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Correction for 'Advancing energy storage and producing potential with a single source driven semiconducting $BaS_3:Cs_2S:La_2S_3$ chalcogenide prepared *via* a sustainable mode' by Khuram Shahzad Ahmad *et al.*, *New J. Chem.*, 2025, **49**, 2291–2307, https://doi.org/10.1039/D4NJ03567D.

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The authors regret that a few closely related papers from our group and collaborators, reporting single-source precursor routes to chalcogenide materials for energy storage and related applications, were not cited in the original article. These include studies on structurally and functionally distinct sulfide and chalcogenide systems prepared *via* similar synthetic strategies and evaluated as electrode or catalytic materials for energy-related applications.[1–5] Although these works do not reproduce the specific $BaS_3:Cs_2S:La_2S_3$ composition or performance described in the *New J. Chem.* article, they provide important methodological and conceptual background that should have been acknowledged. Furthermore, the cited studies share a general interest in barium–metal chalcogenide systems and single-source precursor methods, although none of them reproduces the specific chemistry, structural design, or performance demonstrated in our *NJC* manuscript. Every prior report focuses on alternative cation combinations, but no published work investigates the ternary $BaS_3:Ni_2S_3:Sb_2S_3$ heterostructure. Earlier studies largely evaluate single-purpose energy-storage behaviour, typically limiting electrochemical testing to supercapacitors. Our *NJC* paper, by contrast, presents dual functionality: exceptional high-capacitance energy-storage performance, and water-splitting electrocatalysis (OER/HER), establishing the composite as a truly bifunctional energy material.

The authors would also like to mention here that the IR spectrum shows residual ligand signatures from surface-bound species. The weak C–H stretching band near 2900 cm^{-1} and the C–N vibration around 1450 cm^{-1} originate from trace remnants of the organic precursor ligands rather than from the crystalline $BaS_3:Ni_2S_3:Sb_2S_3$ lattice itself. During single-source precursor synthesis, the diethyldithiocarbamate molecules decompose to release sulfide ions and form the mixed-metal chalcogenide. Because this decomposition is carried out at a relatively low temperature, a minute fraction of ligand fragments can remain weakly attached to the particle surface or adsorbed from the washing solvent (for example, thiourea). These fragments behave like a thin molecular coating: they are physisorbed or chemisorbed only at the outer surface, they do not participate in the crystal framework, and they are commonly observed in low-temperature single-source routes where complete combustion of organic groups is not required for phase formation. Crucially, complementary data obtained from powder XRD confirm that the bulk material is an inorganic sulfide free of structurally incorporated carbon or nitrogen. Thus, the small IR bands simply reflect surface-bound residues, a well-documented phenomenon in metal-sulfide nanomaterial synthesis, and they do not contradict the formation of a pure crystalline sulfide composite.

The authors would like to state that the SEM image was obtained using the only SEM instrument available to us at the time, which limited the resolution. Despite this, the observed morphology is fully consistent with the $BaS_3:Ni_2S_3:Sb_2S_3$ composite, as

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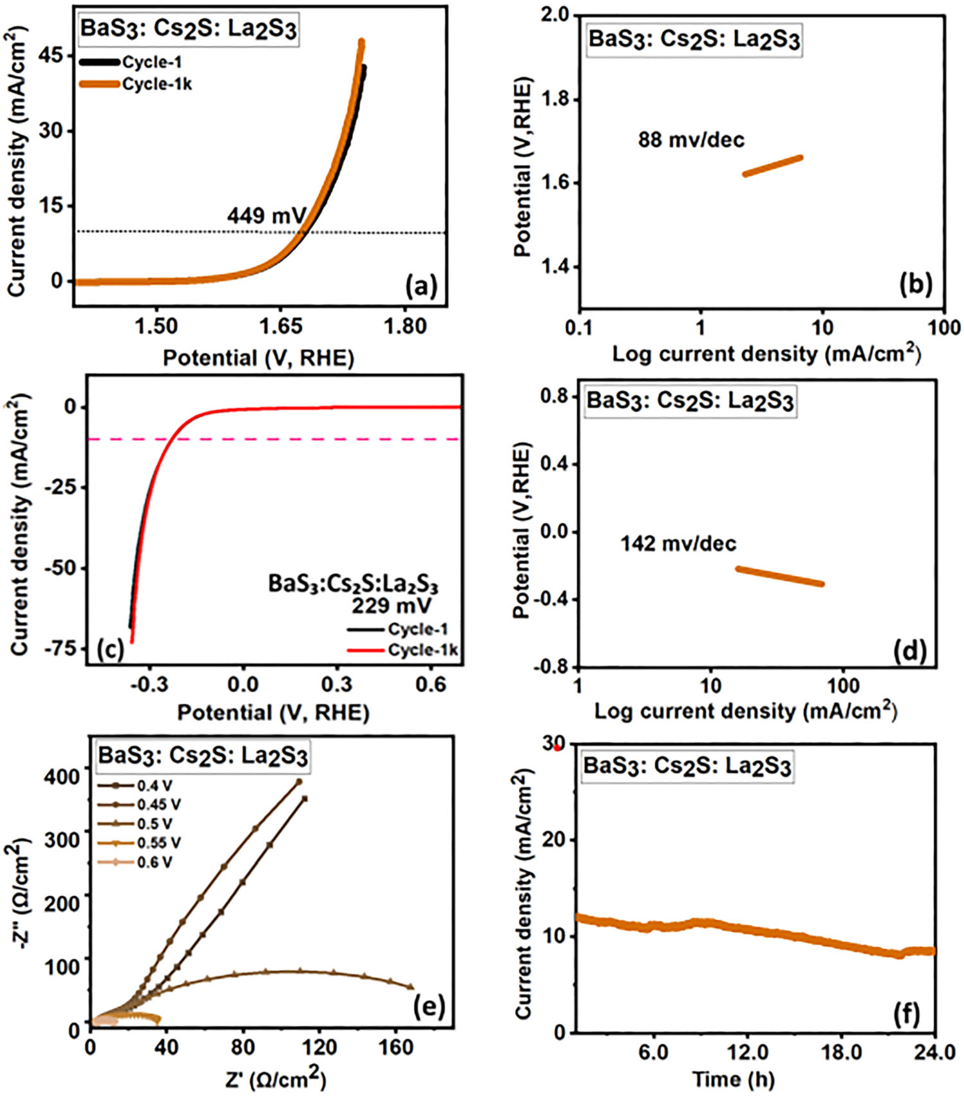

Fig. 7 Semiconducting composite BaS_3:Cs_2S:La_2S_3 chalcogenide's electro-catalytic properties. LSV polarization curves and corresponding Tafel slopes (a)–(d), Nyquist plots, and stability-showing CA (e) and (f).

confirmed by XRD and other physicochemical analytical techniques. We acknowledge the importance of high-resolution imaging and, in future work, will ensure access to advanced SEM facilities for even clearer characterization. Given the strong complementary evidence provided, Fig. 4 accurately represents the synthesized material.

In addition, we sincerely apologize for the error in Fig. 7(c) in the previous version. The corrected Fig. 7(c) is shown in the version of Fig. 7 below, and readers are kindly advised to refer to this updated figure.

Finally, the authors admit some of the references were irrelevant within Section 1, and have provided updated references. Ref. 2 of the original manuscript should be replaced with ref. 6 below, ref. 4 of the original manuscript with ref. 7 below, and ref. 29 of the original manuscript with ref. 8 below.

The authors apologise for these omissions and any confusion that may have resulted.

The Royal Society of Chemistry apologises for these errors and any consequent inconvenience to authors and readers.

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