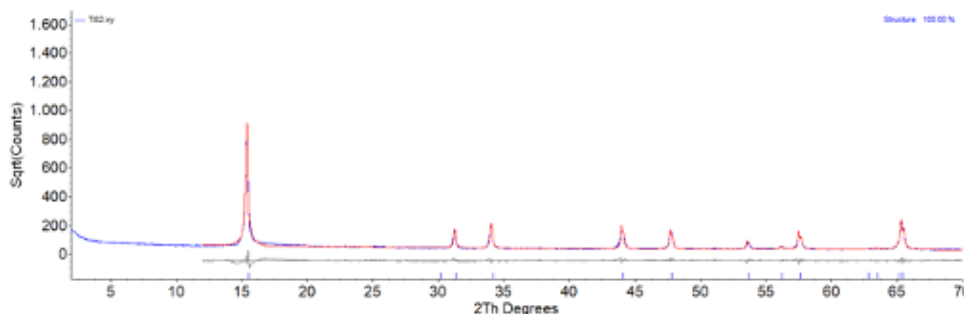


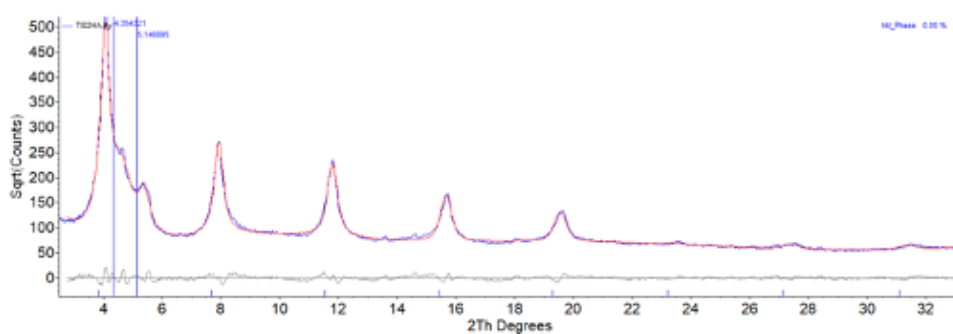
## Long-term stability of TiS<sub>2</sub>-alkylamine hybrid materials

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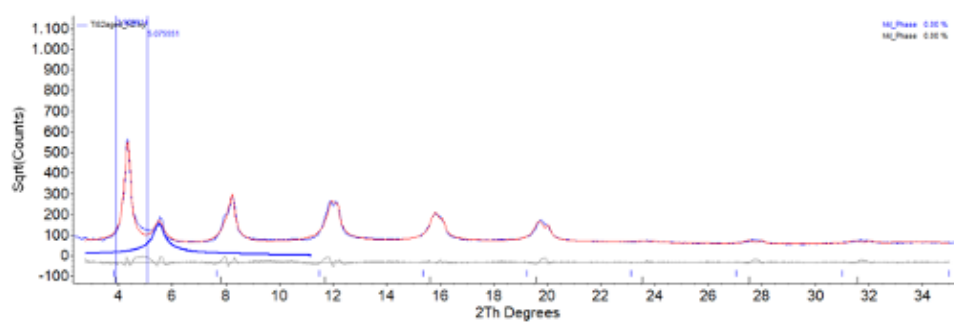
### SUPPORTING INFORMATION



**Figure S1** - Rietveld refinement of the pristine TiS<sub>2</sub> material. Y-axis is in square root scale. All experimental peaks belong to the titanium disulfide structure. XRD modeling required the insertion of a strong textural component, with the preferential orientation parameter  $r_{001} = 0.42$  (in March-Dollase description,).



**Figure S2** - Structureless 1D Le Bail refinement of TiS<sub>2</sub>/HA hybrid *with 00l peaks only*. Y-axis is in square root scale. These experimental peaks are typical of an inflated titanium disulfide structure, with a significantly large interlayer spacing (23.0 Å, vs. 5.7 Å of the original TiS<sub>2</sub> powders). Two additional peaks (vertical lines at 4.35-5.14°) are attributed to minor contaminants characterized by different packings of HA molecules in the interlayer space, or, more likely, to a slightly lower amount of intercalated HA moieties.



**Figure S3** - Structureless 1D Le Bail refinement of TiS<sub>2</sub>/HA (N<sub>2</sub>). Y-axis is in square root scale. No significant differences with respect to TiS<sub>2</sub>/HA. are evident. As explained in the main text, the spurious peak highlighted by the blue trace is attributed to different HA packing (or content).