Title:	Bi4TaO8Cl as a New Class of Layered Perovskite Oxyhalide Materials for Piezopotential Driven Efficient Seawater Splitting
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Keywords:	Layered Perovskite Oxyhalide Piezopotential Driven Efficient seawater splitting sillen−aurivillus flux synthesis
Issue Date:	2022
Publisher:	ACS Publications
Citation:	Nano Letters, 22(22), 8867-8874.
Abstract:	Piezocatalytic water splitting is an emerging approach to generate “green hydrogen” that can address several drawbacks of photocatalytic and electrocatalytic approaches. However, existing piezocatalysts are few and with minimal structural flexibility for engineering properties. Moreover, the scope of utilizing unprocessed water is yet unknown and may widely differ from competing techniques due to the constantly varying nature of surface potential. Herein, we present Bi4TaO8Cl as a representative of a class of layered perovskite oxyhalide piezocatalysts with high hydrogen production efficiency and exciting tailorable features including the layer number, multiple cation–anion combination options, etc. In the absence of any cocatalyst and scavenger, an ultrahigh production rate is achievable (1.5 mmol g–1 h–1), along with simultaneous generation of value-added H2O2. The production rate using seawater is somewhat less yet appreciably superior to photocatalytic H2 production by most oxides as well as piezocatalysts and has been illustrated using a double-layer model for further development.
Description:	Only IISER Mohali authors are available in the record.
URI:	https://doi.org/10.1021/acs.nanolett.2c02900 (https://doi.org/10.1021/acs.nanolett.2c02900) http://hdl.handle.net/123456789/5131 (http://hdl.handle.net/123456789/5131)
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