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### Room Temperature Solid-State Metathetic Synthesis of Photocatalytically Active Monoclinic $\text{BiVO}_4$ and Tetragonal $\text{LaVO}_4$ .

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#### ABSTRACT

*A facile room temperature solid state metathetic synthesis has been developed for the otherwise difficult to synthesize phases by solid-state methods namely monoclinic  $\text{BiVO}_4$  and tetragonal  $\text{LaVO}_4$  using  $\text{Na}_3\text{VO}_4$  and  $\text{BiCl}_3/\text{LaCl}_3$  as reactants. Stoichiometric quantities of respective reactants were mixed and ground in an agate mortar for 2 hours. The grinding induced solid state metathetic reaction between the reactants and the reaction proceeded to completion. The resultant mixtures after being washed with distilled water to remove NaCl by product showed XRD patterns characteristic of respective vanadates and are in good agreement with the corresponding JCPDS data. These are further characterised by FT-IR and SEM. The visible light photocatalytic activity of  $\text{BiVO}_4$  towards degradation of methylene blue is also studied.*

**Keywords:** Bismuth vanadate; lanthanum vanadate; solid state metathetic synthesis; photocatalyst.

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