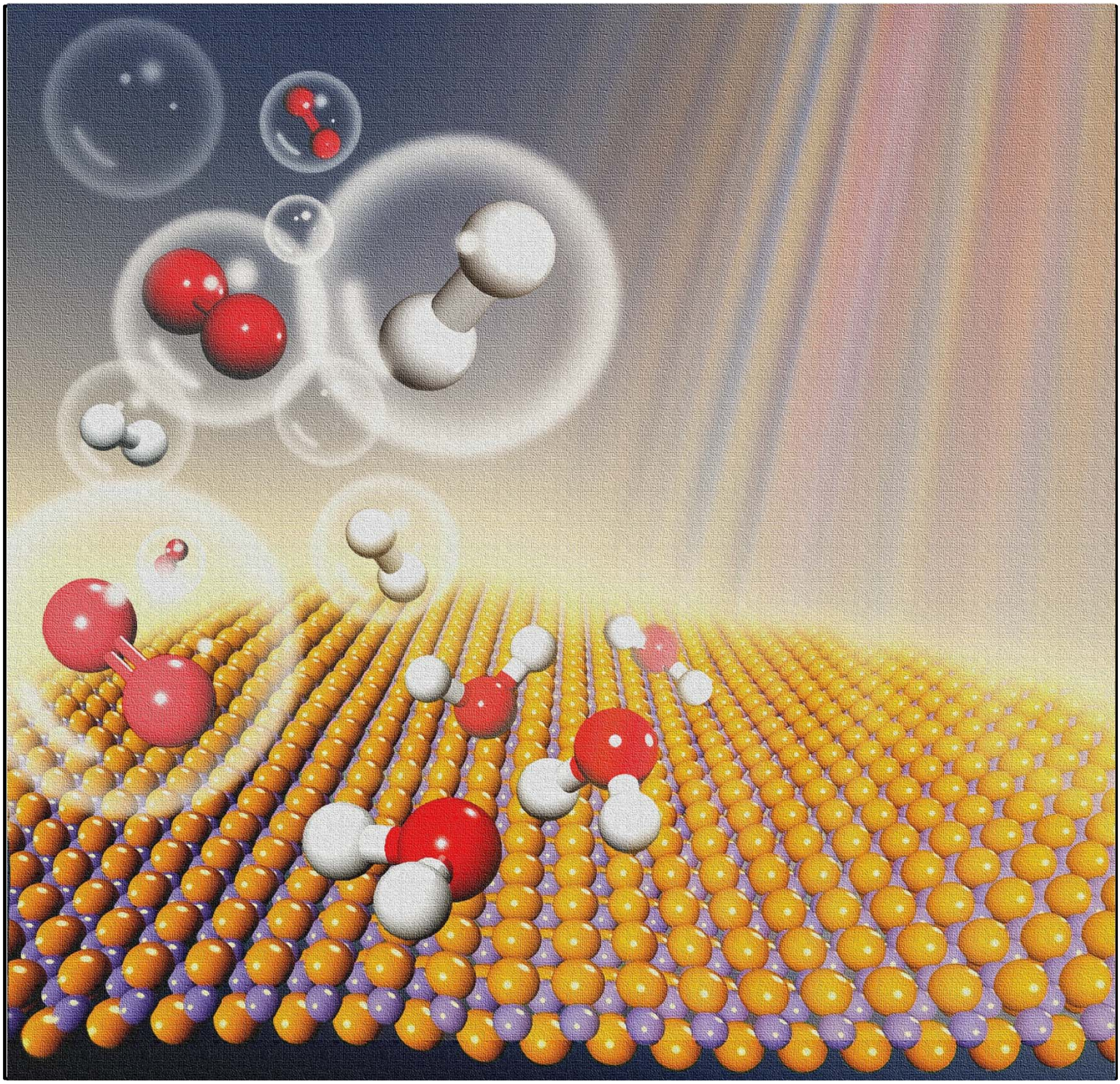

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**This image describes the possibility of using the tetragonal ZnSe monolayer for the visible-light driven water splitting. The molecular models are generated from Materials Studio 7.0 software. All the picture elements are assembled and post-processed in Photoshop software. The water splitting is a crucial process for the production of clean energy hydrogen gas and mostly driven by the ultraviolet. However, the strong intensity of the sunlight is mainly in the visible light region. Our recent work (*Adv. Sci.* 2015, *2*, 15000290) predicts the existence of a new tetragonal ZnSe monolayer and suggests a possible fabrication route for such ZnSe monolayer from the experimentally synthesized hexagonal ZnSe monolayer. Such tetragonal ZnSe monolayer with a highly tunable, direct bandgap can potentially catalyze the splitting of water molecules by absorbing visible light, thus enhancing the utilization efficiency of sunlight.**