Developing efficient and stable photocatalysts for visible light-driven hydrogen production from water is highly desirable for solar energy conversion. Triptycene and its derivatives are a class of interesting compounds with three-dimensional rigid frameworks. Previously, the triptycene-based polymer only can be used as the framework and then decorated by the inorganic materials, such as CdS for photocatalysis. However, the use triptycene derivatives itself as the photocatalysts for visible-light driven hydrogen evolution has never been reported. Herein, a series of triptycene-based discontinuous-conjugated covalent organic polymers (COPs) photocatalysts were demonstrated from triptycene (TP) with thiophene (T) and benzothiadiazole (BT), denoted MT-TP, TT-TP, DTBT-TP, and DPBT-TP. The chemical and photophysical property analyses, various forms of spectroscopy, electron microscopy, density functional theory (DFT) calculations, and photocatalytic function analysis were performed to characterize these triptycene-based COPs photocatalysts. The results show that the replacement of thiophene with benzothiadiazole has a strong positive effect on the photocatalytic performance of COPs. Where, the DPBT-TP shows an excellent efficiency of hydrogen evolution rate (HER) of 17,806 µmol g⁻¹h⁻¹ which is over 1,000-folds higher than that of TT-TP (16 µmol g⁻¹h⁻¹) and over 600-folds higher than that of MT-TP (26 µmol g⁻¹h⁻¹). This is the first demonstration which documents a systematic study for highly efficient triptycene-based covalent organic polymer photocatalysts, allowing the researcher to potentially target different new structures of triptycene-based polymer, providing an important impact in this field.

**Keywords:** Triptycene-Based Polymer, Covalent Organic Polymers (COPs), Visible-light, Hydrogen Evolution,