Boron arsenide, a semiconductor material with a band gap of 1.46 eV, has been synthesized as a thin layer on top of a boron surface via the reaction of the elements in sealed, evacuated quartz tubes heated to 800°C for twelve hours. The identity of the new material has been confirmed using X-ray powder diffraction data and X-ray photoelectron spectroscopy. The newly synthesized boron arsenide material displays p-type behavior and is active under both visible and UV light irradiation. The measured photocurrent is approximately 0.1 mA/cm^2 at an applied potential of -0.25 V vs. Ag/AgCl under full xenon lamp irradiation.