

Abstract

In the presented thesis, metal-organic framework (MOF) PCN-222 was post-synthetically modified with diphenylphosphinic acid. The parent PCN-222 and modified MOFs were characterized by powder X-ray diffractions and nitrogen adsorption isotherms. The presence of bound diphenylphosphinic acid in the modified MOFs was documented by inductively coupled plasma optical emission spectrometry, infrared spectroscopy, and ^{13}C and ^{31}P solid-state NMR. The modified MOFs have greater water-drying stability and up to four times higher singlet oxygen productivity under visible light irradiation than the parent PCN-222.

Keywords: metal-organic framework, porphyrin, post-synthetic modifications, diphenylphosphinic acid, singlet oxygen, stability