Synthesis and Spectroscopic Characterization of Mixed Diamidophosphoric Acid Esters: X-Ray Crystal Structure of \([(CH_3)_2N]_p-H_3C-C_6H_4-O\]P(O)X (X = NH(CH_3)_3 and \(p-H_3C-C_6H_4-NH\))

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Mixed diamidophosphoric acid esters \([(CH_3)_2N]_p-H_3C-C_6H_4-O\]P(O)X, where X = NH(CH_3)\textsuperscript{(1)}, NHCH(CH_3)\textsubscript{2} (2), NHC(CH_3)\textsubscript{3} (3) and \(p-H_3C-C_6H_4-NH\) (4) were synthesized and characterized by \textsuperscript{31}P, \textsuperscript{31}P\{\textsuperscript{1}H\}, \textsuperscript{13}C, \textsuperscript{1}H NMR, and IR spectroscopy and mass spectrometry, and single crystal X-ray diffraction analysis for the compounds 3 and 4. Compound 3 crystallizes in the monoclinic, space group \(P2_1/c\) with unit cell parameters \(a = 9.006(3), b = 16.286(5), c = 10.319(3) \text{ Å}, \beta = 99.633(6)^\circ\), \(V = 1492.2(8) \text{ Å}^3\), \(Z = 4\). The final R value is 0.0622 for 2074 reflections \([I \geq 2\sigma(I)]\). Compound 4 crystallizes in the orthorhombic, space group \(Pna2_1\) with unit cell parameters \(a = 7.0459(14), b = 20.934(4), c = 10.436(2) \text{ Å}, V = 1539.3(5) \text{ Å}^3, Z = 4\). The final R value is 0.0530 for 3025 reflections \([I \geq 2\sigma(I)]\).

**Key words:** Mixed Diamidophosphoric Acid Ester, Spectroscopic Characterization, X-Ray Crystal Structure