Syntheses and Spectroscopic Studies of Some New Diazaphospholes and Diazaphosphorinanes. Crystal Structure of 4-F-$C_6H_4C(O)N(H)P(O)(NHC_6H_4NH)$

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New diazaphospholes and diazaphosphorinanes with formula 4-F-$C_6H_4C(O)NHP(O)(NHC_6H_4NH)$ (**1**), 4-CH_3-$C_6H_4NHP(O)(NHC_6H_4NH)$ (**2**), 4-CH_3-$C_6H_4NHP(O)(NHC_{10}H_6NH)$ (**3**), 4-CH_3-$C_6H_4NHP(O)(NHCH_2C_6H_4NH)$ (**4**), 4-F-$C_6H_4C(O)NHP(O)(NHCH_2C_6H_4NH)$ (**5**), $CCl_3C(O)NHP(O)(NHCH_2C_6H_4NH)$ (**6**) and 4-CH_3-$C_6H_4NHP(O)(NHCH_2C(CH_3)_2CH_2NH)$ (**7**) were synthesized and characterized by ^{1}H, ^{13}C, ^{31}P NMR and IR spectroscopy and elemental analysis. The structure of compound **1** has been determined by X-ray crystallography. A one-dimensional polymeric chain was observed in the crystalline lattice produced by intermolecular -P=O…H-N- and -C=O…H-N-hydrogen bonds. Compounds **1** and **2** contain five-membered rings and show high values for ^2J(PNH) and ^2J(P,C) coupling constants due to the ring strain. These constants are reduced seriously in compounds with six-membered rings. In compound **6** with $CCl_3C(O)NH$ moiety, all phosphorus-hydrogen couplings are zero.

Key words: X-Ray Crystallography, NMR Spectroscopy, Diazaphosphorinane, Diazaphosphole