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Tricycles Synthesized by the Reaction of PCl_5 with Open-chained Molecules

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Tricycles Synthesized by the Reaction of PCl_5 with Open-chained Molecules

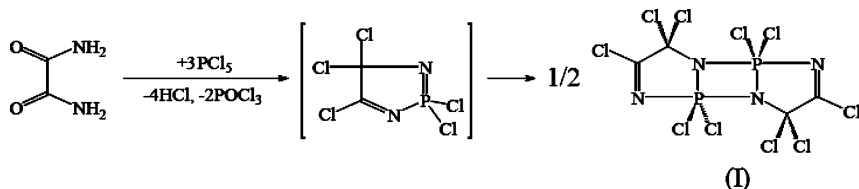
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The crystal structure of two tricyclic compounds prepared by reaction of oxamide or glutamic acid with PCl_5 was determined.

Keywords Crystal structure; glutamic acid; oxamide; phosphazenes; tricycles

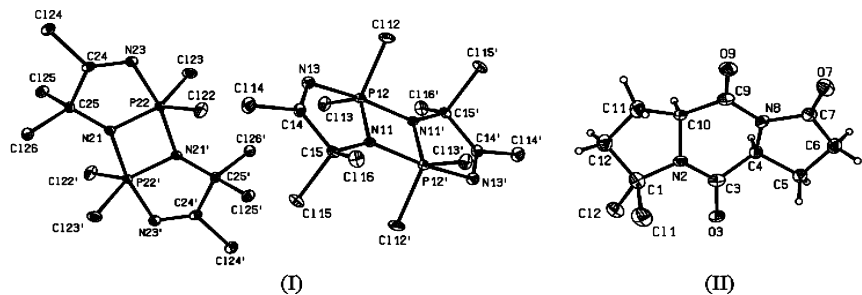
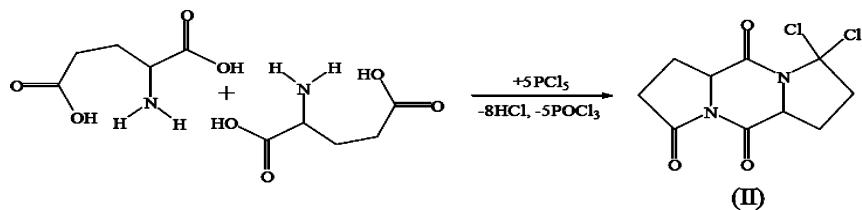
The tricyclic reaction products of PCl_5 with two open-chained molecules containing $\text{C}=\text{O}$ and NH_2 groups are characterized by single-crystal structure determinations: The reaction of oxamide with PCl_5^{1-2} resulted in the symmetric compound (I), formed by a ring closure reaction followed by a [2+2] cycloaddition:



The reaction of glutamic acid with PCl_5 takes a completely different course and the hitherto unknown unsymmetric compound (II), a derivative of the dipeptide cyclo(prolylproline), was formed repeatedly:

Obviously, no phosphorus atoms were incorporated in a ring closure reaction and PCl_5 acts mainly as a dehydrating agent. The crystal structure determinations were performed at low temperature: Compound (I) has two half molecules in the asymmetric unit and shows almost planar tricycles arranged around centers of symmetry. The molecules of compound (II) lie on general positions.

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