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## Phosphorus, Sulfur, and Silicon and the Related Elements

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### Herbicidal Activity of Phosphonic, Phosphinic and Phosphinous Acid Analogues of Aromatic Amino Acids

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## HERBICIDAL ACTIVITY OF PHOSPHONIC, PHOSPHINIC AND PHOSPHINOUS ACID ANALOGUES OF AROMATIC AMINO ACIDS

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Over 40 phosphonic, phosphinic and phosphinous acid analogues of phenylglycine and phenylalanine were synthesized and screened for their herbicidal activity on *Lepidium sativum* (crest) and *Cucumis sativus* (cucumber). The most active appeared to be 2-amino-1-hydroxy-3-phenylpropylphosphonic acid which was equipotent with popular herbicide glyphosate. Also aminobenzylphosphonic acids, analogues of phenylglycine, exhibited notable herbicidal activity and thus represent a group of the most active herbicides found among simple aminophosphonic acids. Other compounds showed moderate herbicidal activity. Preliminary results indicate that analogues of aromatic amino acids display their activity as effectors of biosynthesis of aromatic amino acids.

Synthesis of enantiomerically pure 2-amino-1-hydroxy-3-phenylpropylphosphonic acids were achieved by simple addition of diethyl phosphite to enantiomers of N-blocked phenylalaninals. This reaction was found to be highly stereoselective. Since the obtained compounds may be also considered as phosphonic acid analogues of statine their inhibitory potency towards cytosolic (EC 3.4.11.1) and microsomal (EC 3.4.11.2) aminopeptidases was evaluated. Both stereoisomers, however, were found to be the weak inhibitors of the enzymes.