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## Chiral pesticides

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### Abstract:

The enantiomers of chiral pesticides are often metabolized at different rates. In agriculture, the preferred chiral form of a pesticide is more effective at lower application rates or more specific toward a targeted pest. Other advantages of chiral pure pesticides include greater environmental safety, reduced cost, greater specificity and extended patent life. Recent progress in optical resolution, asymmetric synthesis and biocatalysis of chiral pesticides has been described. Techniques to separate enantiomers with chiral HPLC and GC columns, electrophoresis and mass spectrometry have been reported. Chiral chase is actively pursuing asymmetric hydrogenation for the manufacture of a pure single-enantiomer pesticide. Enantioselectivity occurs in pesticidal activities toward target organisms as well as non-targeted organisms. There is a need to characterize both enantiomers of chiral pesticides in order to have an accurate understanding of their distribution and fate in the environment. Enantiomeric analysis can be useful in this aim and this is an important consideration in the risk assessment of pesticides. Use of only the target-active enantiomer of pesticides should be encouraged as it will reduce the pollutant load, provided it has no adverse impact on non-target organisms.

### Keywords:

chiral pesticides, enantioselectivity, chiral separation, chiral technology, toxicity

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