

Identification of Student Problem-solving Strategies in Organic Chemistry

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Students' problem-solving strategies have been researched extensively, but the identification of discipline-specific strategies is a relatively recent development in chemical education. This presentation will focus on the methods used in a recent study of student problem-solving strategies in organic chemistry. The 22 undergraduate volunteers participated in videotaped think-aloud protocols in which they predicted the products of 13 chemical reactions from given reactants and reagents. After verbatim transcription, data were analyzed via procedural task analysis and thematic analysis with constant comparison to identify specific problem-solving behaviors. The relationships between behaviors were identified via principal components analysis, hierarchical cluster analysis, and bivariate correlation. Six problem-solving strategies were identified, but triangulation with data from semi-structured interviews was only partially successful. Implications for problem-solving research in science education will be addressed.

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