

Introduction

In this project we focused on the use of MIPs¹ in a chromatographic sense to selectively isolate menthyl (hydroxymethyl)-phenyl phosphinate in the S_P form within a mixture of both diastereoisomers². R and S configurations are made in equal proportions but the yield from isolation and crystallization of each pure diastereoisomer is low. Production of a polymer containing pockets specific to the configuration of one diastereoisomer enables an easier method to isolate that compound through absorption by the polymer and subsequent release. The potential for MIPs for these P-stereogenic compounds lies in the increase yield of pure crystals and therefore decreased cost of production.



- 1. Cheong, S., Rachkov, A. E., Park, J., Yano, K., & Karube, I. (1998). Synthesis and binding properties of a noncovalent molecularly imprinted testosterone-specific polymer. Journal of Polymer Science Part A: Polymer Chemistry, 36(11), 1725-1732. Retrieved May 16, 2016. 2. Berger, O., & Montchamp, J. (2013). A General Strategy for the Synthesis of P-Stereogenic
- Compounds. Angewandte Chemie, 125(43), 11587-11590.

SEPARATION OF MENTHYL (HYDROXYMETHYL)-PHENYL PHOSPHINATE USING MOLECULARLY IMPRINTED POLYMERS Kari Hancock^a, Dr. Jean-Luc Montchamp^{a*} a - TCU

31P NMR Spectra



8 2 The ideal V shape trend in the graph starts with an initial ratio being a base point. The ratio after soaking the polymer should decrease as S_P (right peak) is removed from solution. This is followed by an increase to a higher ratio number, as the major compound should be the S_P diastereoisomer. The NMR shows the right (S) vs. left (R) peaks from the 0.5 ratio polymer (Total Wash Ratio 1/1.02).

In the end the most promising experiment was 33 with a 0.5 ratio of MAA to EGDMA (lowest line on graph). The results obtained were useful in proving that our project was headed in the correct direction as the polymer was more selective for the S_P template molecule. There are a number of variables (solvent, ratio, time) that can be altered in order to refine the selectivity of the polymer. **Acknowledgements: TCU SERC, Rachel Butler**



Polymerization Reaction



Summary

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