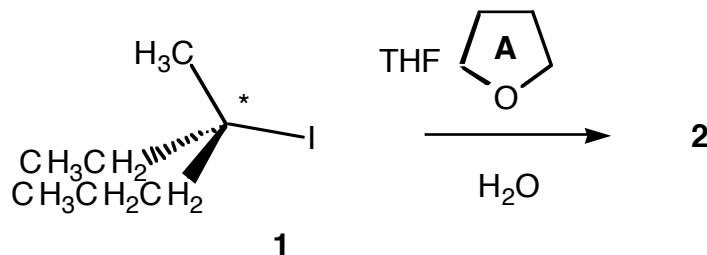


Problem 56, Chemistry 301X - 2006

When tertiary iodide **1** is allowed to react with a 50/50 mixture of tetrahydrofuran (THF = **A**, an ether **less** polar than water) and water, the resulting product (**2**) has a rotation of + 34°.



1. What is product **2**? Do not worry about stereochemistry (yet).
2. The product **2** is optically active - it rotates the plane of plane-polarized light. Can one make any statement about the rotation of **1** from the fact that compound **2** has a rotation of + 34°?
3. Is this reaction  $\text{S}_{\text{N}}1$  or  $\text{S}_{\text{N}}2$ ? Get this answer checked!
4. Why is compound **2** still optically active?
5. When compound **1** is allowed to react in pure water (no THF) the same product, **2**, is formed, but there is no rotation. Explain.