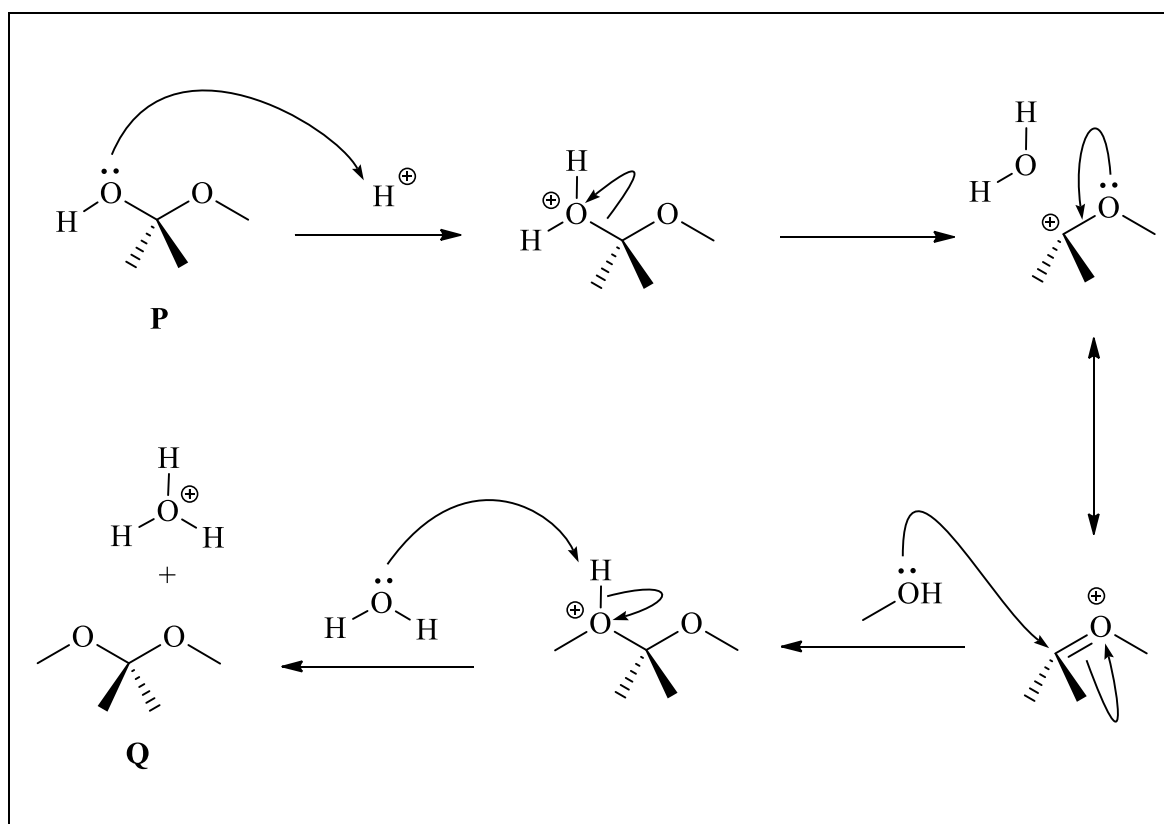


- A step-by-step mechanism for the formation of an acetal from a hemiacetal is outlined below. Demonstrate your understanding of reaction mechanisms by adding curly arrows to complete this mechanism.

**Marks**  
**5**

*Note: you don't need to have seen this mechanism before to answer this question.*



Overall, what type of reaction ( $\text{P} \rightarrow \text{Q}$ ) is shown here?

**Substitution**

Identify one nucleophile and one electrophile in the scheme above.

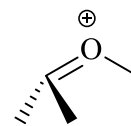
nucleophile

**$\text{H}_2\text{O}$  or  $\text{CH}_3\text{OH}$**

electrophile

$\text{H}^+$

or



**THE REMAINDER OF THIS PAGE IS FOR ROUGH WORKING ONLY.**