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Pyridinium Chlorochromate. An Efficient Reagent for Oxidation of Primary and Secondary Alcohols to Carboxyl Compounds

Classic Oxidation of Alcohols Using Pyridinium Chlorochromate

Significance: In 1975, Corey and Suggs developed the efficient oxidation of primary and secondary alcohols to the corresponding carbonyl compounds by treatment with pyridinium chlorochromate (PCC). The advantages of this method (also known as Corey–Suggs oxidation) are the simple procedure, efficiency, versatility and the prevention of over-oxidation. On the other hand, chromium(VI) compounds are toxic and must be handled with care.

Comment: Interestingly, the authors reported the preparation of pulegone in one step from citronellol using two subsequent oxidations.

Selected examples:

- $\text{R}^1 = \text{Alk}; \text{R}^2 = \text{H, Alk}$

\[
\begin{align*}
\text{PCC (1.5 equiv)} & \quad \text{CH}_2\text{Cl}_2, \text{r.t.}, 1–2 \text{ h} \\
\text{R}^1 & \quad \text{O} \\
\text{R}^2
\end{align*}
\]

92% yield

68% yield

97% yield

78% yield

85% yield

82% yield

(0.3 equiv NaOAc was added)

one-pot reaction:

- $\text{citronellol}$

- $\text{pulegone}$

Key words: chromium compounds, oxidation, alcohols, aldehydes, ketones