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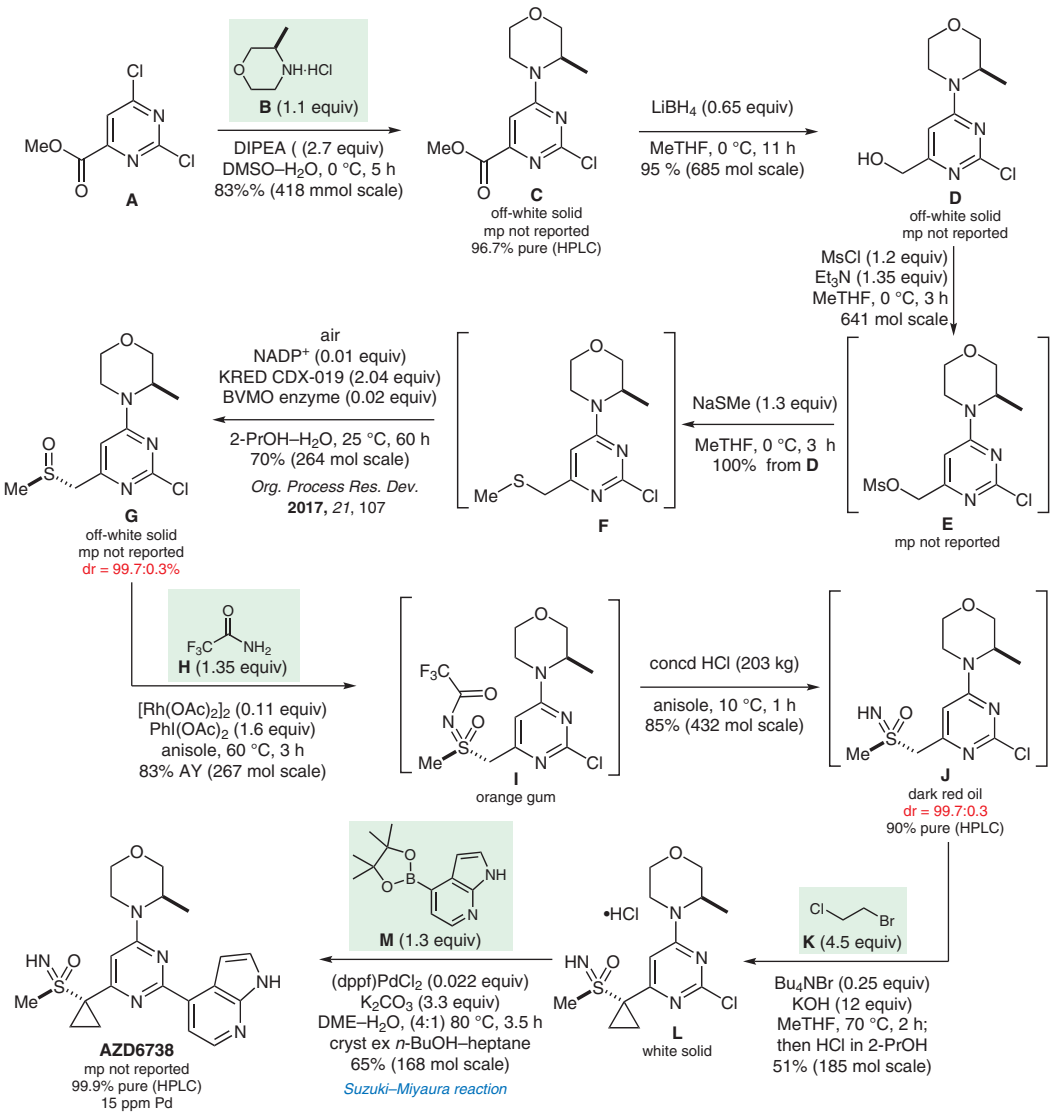
Development and Scale-up of a Route to ATR Inhibitor AZD6738
Org. Process Res. Dev. **2019**, *23*, 1333–1342.

Synthesis of AZD6738



Significance: Workers at AstraZeneca recently reported a mol-scale synthesis of ATR inhibitor AZD6738 based on the use of chiral HPLC to access the chiral sulfoxide intermediate **G** (*J. Med. Chem.* **2018**, *61*, 9889). A plant scale synthesis of AZD6738 is now reported that features a biocatalytic asymmetric sulfoxidation reaction (**F** → **G**) and a cyclopropanation (**J** → **L**) in continuous stirred tank reactors.

Comment: The sulfoxidation reaction uses a Baeyer–Villiger monooxygenase in tandem with nicotinamide adenine dinucleotide phosphate (NADPH), which is oxidized to $NADP^+$. NADPH is then regenerated through reduction of $NADP^+$ by a ketoreductase (KRED) enzyme, which in turn oxidizes the co-solvent isopropanol to acetone. Efficient gas–liquid mass transfer of oxygen is key to obtaining a high yield.

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Category
Synthesis of Natural Products and Potential Drugs

Key words
AZD6738
asymmetric sulfoxidation
sulfoximines
biocatalysis
rhodium catalysis

Synfact of the Month

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