

# [Product formulation portfolio; evaluation pro-forma 4 (pfpe4)](https://assignbuster.com/product-formulation-portfolio-evaluation-pro-forma-4-pfpe4/)

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Product Formulation Portfolio; Evaluation pro-forma 4 (PFPE4) Table4. New formula (including new ingredients/replacement ingredients) formula evaluation
Pyridine
New Formula: C7H6O3 (Salicylic acid) +C2OH3Cl (acetyl chloride) C9H8O4 (Aspirin) + HCl (hydrogen chloride)
Old Ingredient
New ingredient
Why replacing the old one (is it better? more natural? Less toxic?)
Chemical Characteristic
Role in the formulation
Acetic anhydride (CH3CO)2O)
Acetyl chloride(C2OH3Cl)
The old ingredient (Acetic anhydride) is replaced because it is a less vigorous acylating agent as compared to the new ingredient (Acetic chloride). Additionally, Acetyl chloride is cheap and readily available (2).
Acetyl chloride (C2OH3Cl) is a colourless to light yellow fuming liquid which violently reacts with water and lower alcohols to form acetic acid and hydrogen chloride (1). Lastly, the irritating liquid readily fumes in the air.
Acts as a high quality acetylation agent due to its high reactivity and ability to produce irreversible reactions with weak acids such as salicylic acid.
85% Phosphoric acid
Pyridine
The old catalyst (85% Phosphoric acid) is replaced with a new catalyst (Pyridine) because Pyridine serves both as a catalyst for the acetylation reaction as well as a base for neutralizing the resulting hydrochloric acid (4). HCL is normally formed as a by-product of the reaction between acetyl chloride and Salicylic acid.
Pyridine is a weakly basic catalyst that is miscible with water as well as most of the common organic solvents (3).
During the formulation of Aspirin, Pyridine plays an important role both as a catalyst for the acetylation reaction and as a base for neutralizing the resulting hydrochloric acid that is formed during reaction between acetyl chloride and Salicylic acid
Reference List
1. Jeffreys, D. 2005. Aspirin: The Remarkable Story of a Wonder Drug. New York, NY: Bloomsbury.
2. Leo A. 2005. Acetyl chloride: Handbook of Reagents for Organic Synthesis, Activating Agents and Protective Groups. John Wiley & Sons.
3. Palleros, D. R. 2000. Experimental Organic Chemistry. New York: John Wiley & Sons.
4. Zumdahl, S. S. 2009. Chemical Principles 6th Ed. New York: Houghton Mifflin Company.