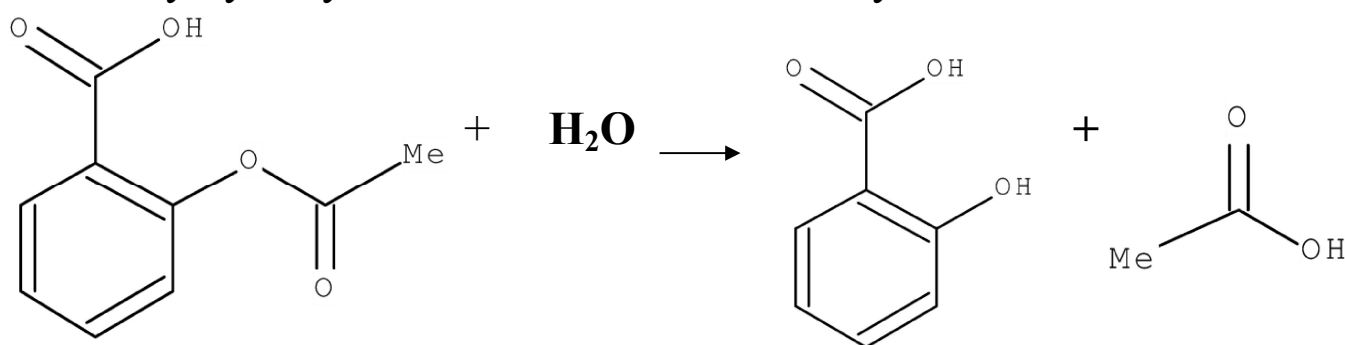


### Lab. 3

## Stability of Aspirin (Storage Test)

Expire of any drug means that 10% of drug concentration is decomposed at room temperature. Pharmaceutical decomposition can be classified to hydrolysis, oxidation, isomerization, and photolysis, and these processes may affect the stability of drug in liquid, solid, and semisolid.

Aspirin mostly decomposed by hydrolysis, reaction with water. It is stable in dry air, but in the presence of moisture, it slowly hydrolyzes into acetic acid and salicylic acid.



Hydrolysis of aspirin is first order kinetic, where rate of reaction depends on concentration of aspirin. As in the first order reaction law:

$$\log C = \log C_0 - \frac{kt}{2.303} \quad \dots\dots(10)$$

where,  $C_0$  initial concentration.

$C$  remaining concentration

$k$  first order rate constant ( $\text{time}^{-1}$ )

$t$  time

In many pharmaceutical-manufacturing companies, in order to determine the hydrolysis of aspirin, used elevated temperature