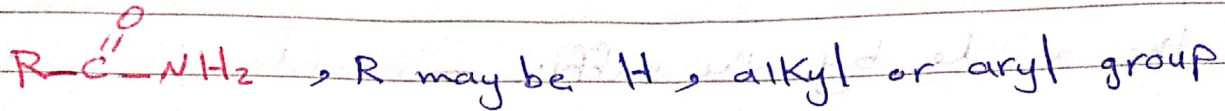


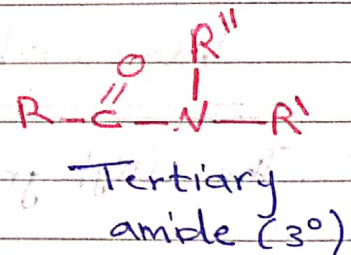
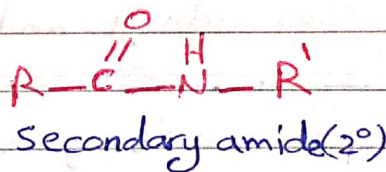
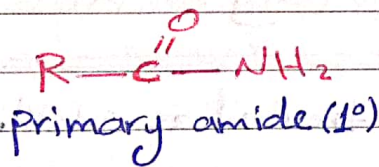
Amides : الأميدات

Amides are derivatives of carboxylic acids, they have the structure :



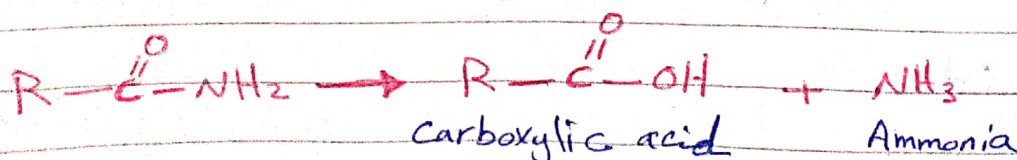
Classification of Amides :-

Amides are classified according to the number of substituted connected to the nitrogen of the amide group :-



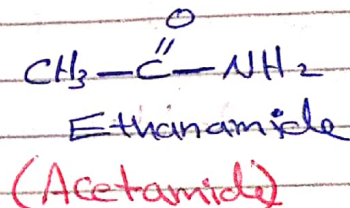
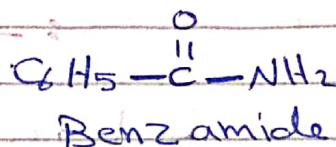
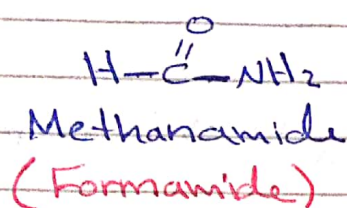
Nomenclature of Amides :-

An amide is named based on the recognition that it is a composite of a carboxylic acid and ammonia or an amine .



primary amides are, thus named by replacing the suffix **-oic acid** in the IUPAC name or the suffix **-ic acid** in the ^{Common} name of the parent carboxylic acid of the amide by the suffix **-amide**.

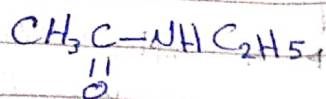
Examples :-



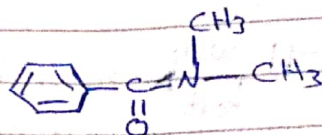
Names of Secondary and Tertiary amides

The alkyl groups on nitrogen are treated as substituents, and their position is specified by the prefix **N-** to differentiate them from any substituents located on the parent chain of the parent carboxylic acid.

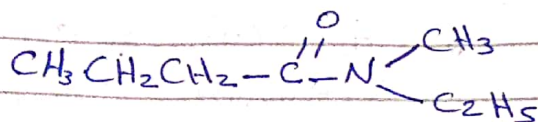
* If more than one substituents is bonded to nitrogen, they are stated alphabetically followed by the name of the amide.



N-Ethylacetamide



N,N-Dimethylbenzamide

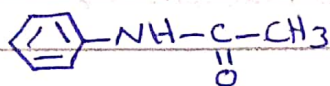


N-Ethyl-N-methylbutyramide

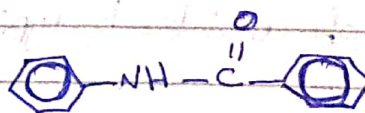
* In many cases, and particularly where aromatic amines are involved, we are more interested in the amine from which the amide is derived than in the acyl group.

In these cases the substituted amide is named as an acyl derivative of the amine.

Example :-



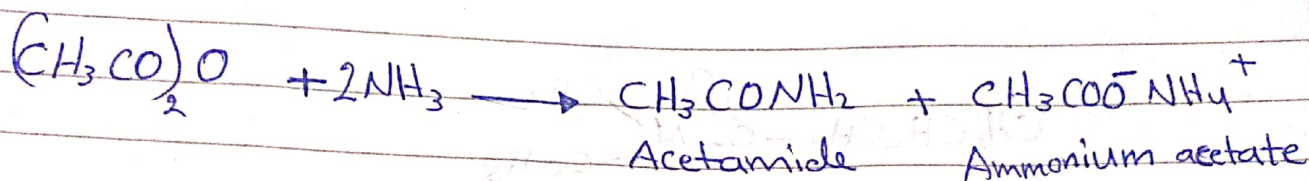
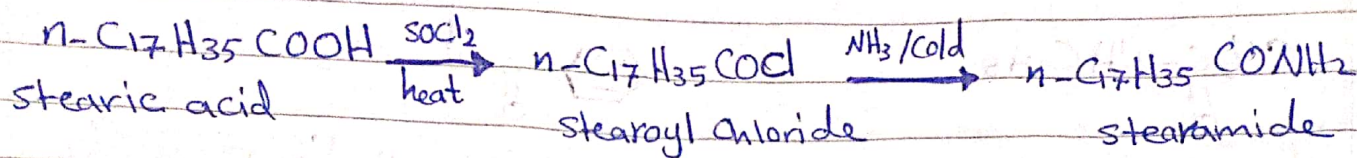
Acetanilide



Benzanilide

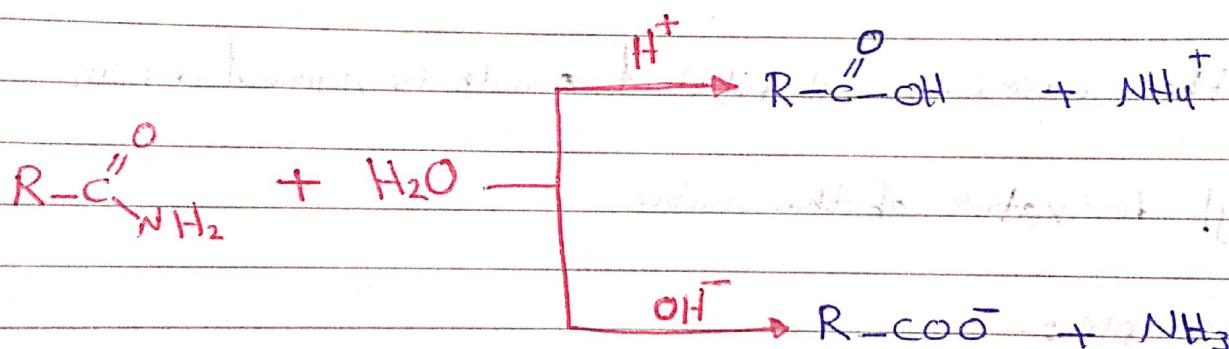
Preparation of amides :-

In the laboratory, amides are prepared by the reaction of ammonia with acid chlorides, or when available, acid anhydrides



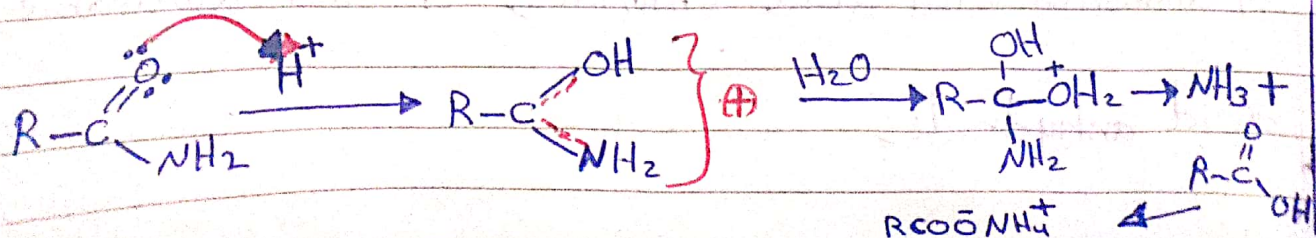
Reactions of amides : التفاعلات، تحلّلات

1- An amide is hydrolyzed when heated with aqueous acids or aqueous bases

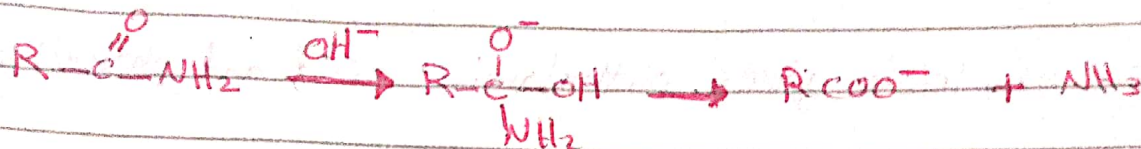


* hydrolysis of amides is typical of the reactions of carboxylic acid derivatives. It involves nucleophilic substitution, in which the $-\text{NH}_2$ group is replaced by $-\text{OH}$.

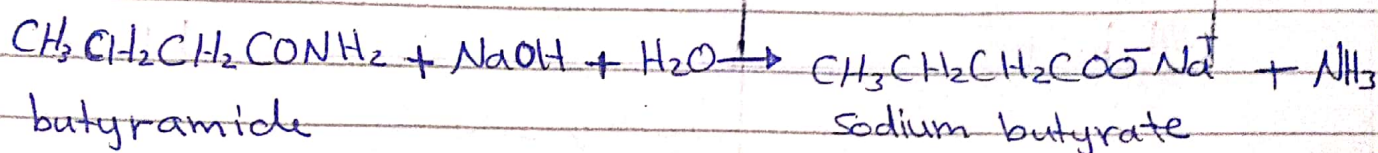
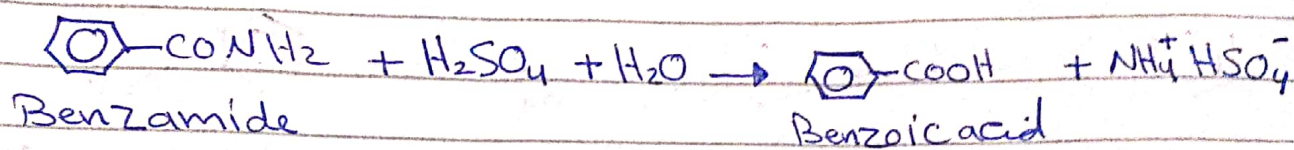
x under acidic conditions hydrolysis involves attack by water on the protonated amide :-



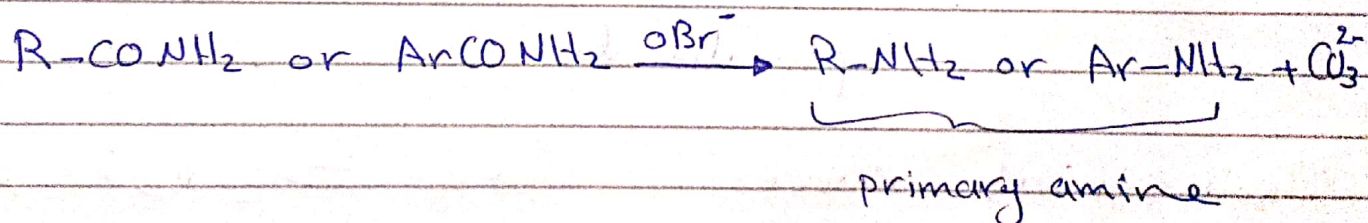
under alkaline conditions hydrolysis involves attack by the strongly nucleophilic hydroxide ion on the amide itself:



Examples:



2- Hofman degradation of amides

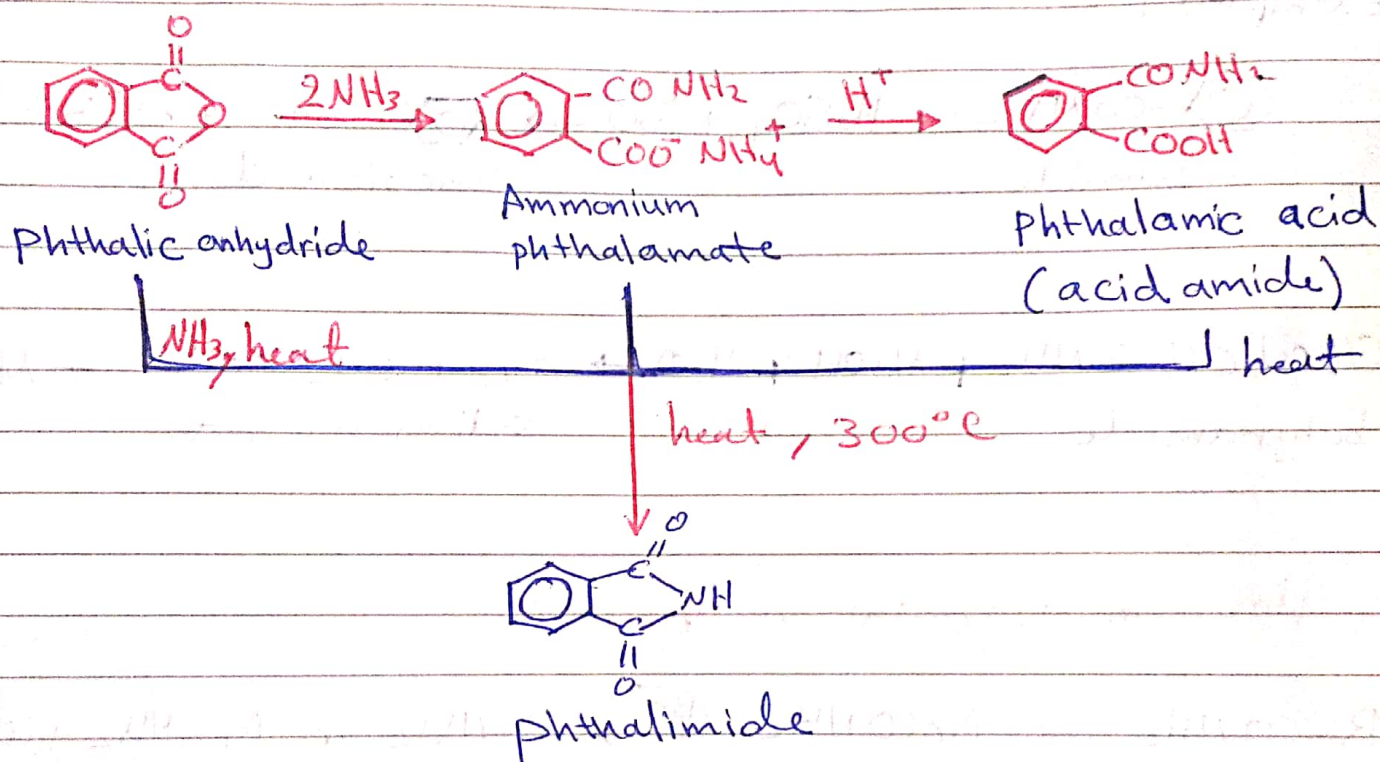


Imides

Like other anhydrides, cyclic anhydrides react with ammonia to yield amides; in this case the product contains both

$-\text{CONH}_2$ and $-\text{COOH}$ groups. If this acidamide is heated, a molecule of water is lost, a ring forms, and a product

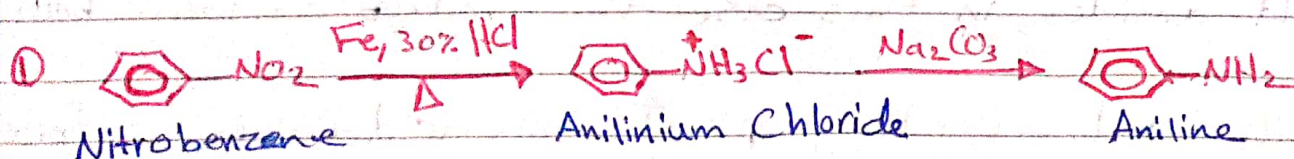
is obtained in which two acyl groups have become attached to nitrogen, compounds of this sort are called **imides**, Phthalic anhydride gives phthalamic acid and phthalimide



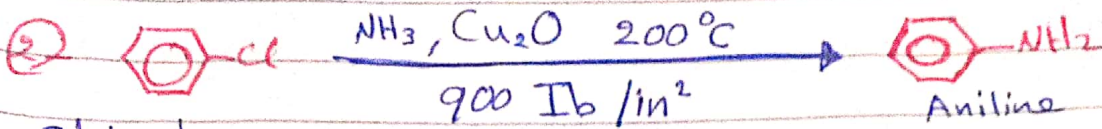
Industrial Sources

مصادر صناعية

Some of the simplest and most important amines are prepared on industrial scale by processes that are not practicable as laboratory methods :-



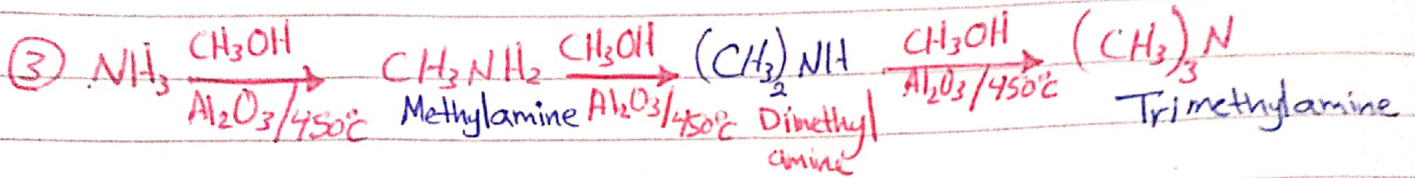
اختزال مركب النيتروبنزين باستخدام مواد ذات كلفة قليلة مثل الحديد وحامض الهيدروكلوريك المخفف



Chlorobenzene

Aniline

تمثل الطريقة أعلاه امرار الأمونيا على مركب الكلورو بنزين بدرجة حرارة وضغط عاليتين وبوجود عامل مساعد مثل اوكسيد النحاس.

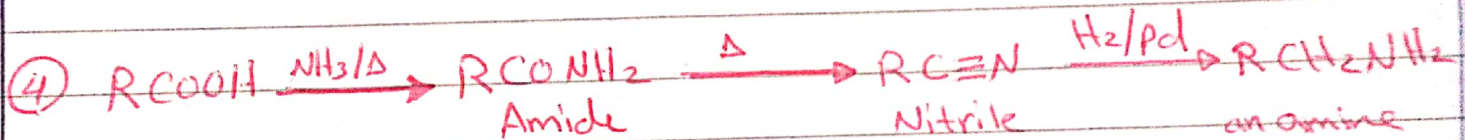


Methylamine

Dimethylamine

Trimethylamine

أعلاه يمثل تحضير الأمينات الأولية وذلك من امرار الأمونيا والكلور المتطاير تحت حرارة عالية وبوجود عامل مساعد مثل اوكسيد الألمنيوم.



Amide

Nitrile

an amine