



Genuine Shell Carb (P) Ltd

Activated carbon process

Activated carbon:

Generally the term of activated carbon is containing pores, while adsorption capable with the induced of developing porosity as much as raw material.

The most commonly used raw materials are coal, coconut shells, wood (both soft and hard) peat and petroleum based residues.

Most carbonaceous material having a certain degree of porosity and an internal surface area in the range of 10-15 m² /g, during the activation process, the internal surface area becomes more highly developed and extended by controlled oxidation of carbon atoms, by steam with high temperature usually.

After activation, the carbon is potentially activated, called activated carbon. The internal surface area range might be 700 and 1200 m² /g.

Internal pores are usually classified as follows

Micro pores

Mesopores

Macro pores

Macro pores:

When manufacturing process, macro pores are first formed by the oxidation of weak points on the external surface area of the raw material (edge side) these having size of measured approximately as, above 5000Å⁰ [typically 5000-20000Å⁰]

Meso pores:

Meso pores are the formed and are essentially secondary channels formed in the walls of the macro pores structures. These having size of measured approximately as, 40-5000Å⁰.

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Micro pores:

The micro pores are formed finally. by attack of the planes with in the structure of the raw material.

Notes:

All activated carbon contains micro pores, meso pores, and macro pores with in the structures. But the relative proportions vary considerably according to the raw material.

Here micro pores structure has been found ideal for the adsorption of small molecular weight species and reaming pores are predominate to the large molecular weight species.

Methods of manufacture:

The activated carbon process many other methods of activation of carbon. But chemical activation and steam activation are only applicable, here usually high-fired carbon having raw material can be effect able.

Steam activation

Steam activation, initially involves the removal of volatiles, followed by the oxidation of the structures carbon atoms.

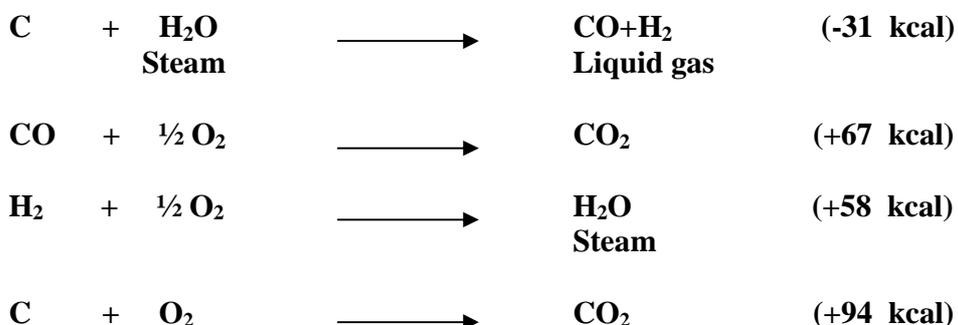
The uses of steam for activation can be applied to virtually all raw materials.

A variety of methods have been evaluated and developed but all these share the same basic principle of initial carbonization at 500⁰C - 600⁰C followed by activation with steam at 800 – 1100⁰ C.

Since usually reaction (converting carbon to carbon dioxide) is exthothermic it is possible to utilize this energy and have a self-surfacing process.



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A number of different type of kiln and furnace can be used for carbonization/activation and include. Rotary, vertical multi hearth furnaces, fluidized bed reactors and vertical single throat retort. Each manufacture has their own preference.

Our preferable process is rotary kiln method.

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