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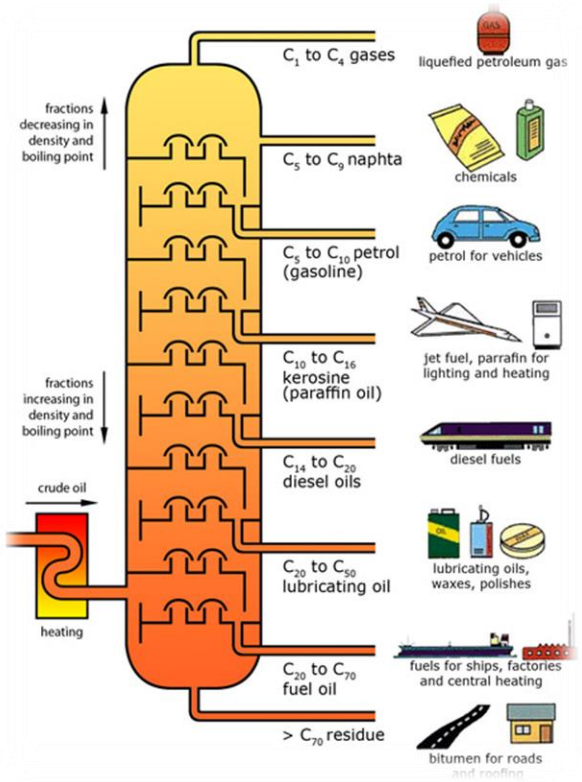
What is Heartcut?

The various components of a mixture have different molecular sizes, molecular weights and boiling temperatures. Because they have different boiling temperatures, they can be separated by a process called fractionation and heart cutting. In industries, such as petroleum processing, heart cutting is done with the help of fractional distillation. Heart cutting a mixture will result in heads, hearts and tails. The basic chemical science involves the separation of a chemical substance into its different components based on the difference in the boiling point of each fraction. This is done by heating a mixture so the fractions that make up the mixture begin to evaporate. The more volatile components of the mixture, or those fractions with a lower boiling point, and the shorter hydrocarbon chains, will tend to evaporate first and are called the heads. The rest of the molecules separate out according to their boiling and condensation points. The heavier, less volatile products settle out and are called the tails. The heart cuts are the gasses that fall between the volatility and boiling point ranges of the heads and tails.



For example, in the petroleum industry, crude oil enters the refinery as a thick black liquid not suitable for use as gasoline. The oil contains a mixture of hydrocarbons and will need to be separated in order to be useful. Fractional distillation is an effective process which separates the compounds by using the difference in their boiling points. Crude oil is fed to the system, heated, and enters the distillation column as a gas. The column will be hot at the bottom and cooler at the top. This difference in temperature as the crude gas moves through the column will sort the different fractions as heads, hearts and tails. The smaller hydrocarbons stay as gases (heads) and the larger hydrocarbons with the higher boiling points turn back into liquids at the base of the column (tails). The heart cuts are those distillates that lie between the head and tails in volatility and boiling points.