



Vacuum Distillation is Proposed to Recover Tellurium

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DESCRIPTION

Vacuum Distillation (VD) membrane is distillation performed under reduced pressure, which allows the purification of compounds not readily distilled at ambient pressures or simply to save energy. Vacuum distillation technique separates compounds based on differences in their boiling points. This method is used when the boiling point of the desired compound is difficult to achieve the compound to decompose. Reduced pressure decrease the boiling point of compounds. The reduction in boiling point can be calculated by using a temperature pressure monograph using the Chaperon relation. A Vacuum Distillation (VD) is used when the boiling point of the compound is too high ($T_b > 150^\circ\text{C}$) in order to distill the solvent off without significant decomposition. The setup is similar to a semi macro scale distillation. It is the technique of reducing the pressure in the solvent to less than the vapor pressure of the mixture, creating a vacuum, and causing the elements with lower vapor pressures to evaporate off.

The key difference between Atmospheric Distillation (AD) and Vacuum Distillation (VD) is that the atmospheric distillation is used to separate low boiling point of a combination whereas vacuum distillation membrane allows the components to be separated easily through reducing the boiling point of a high boiling fraction. It is a part of the refining technique that helps to produce petroleum products out of the heavier oils left over from atmospheric distillation. In the refining technique, the Atmospheric Distillation Unit (ADU) separates the lighter hydrocarbons from the heavier oils based on boiling point. Vacuum Distillation (VD) membrane uses vacuum to reduce the boiling point of the liquids being distilled, because they are too high at atmospheric pressure or they may decompose at normal boiling point.

Steam Distillation (SD) uses a stream of steam passing through the liquids being distilled. In petroleum refining, the Vacuum Distillation Unit (VDU) is a secondary processing unit that similarly refines heavier oils left over after the crude oil feedstock is initially run through the atmospheric distillation unit; it is also called as the Crude Distillation Unit (CDU). The technique

is based on differences in the relative volatility of the different components. In vacuum distillation membrane, vacuum is used to reduce the boiling point of the substances to be separated.

It is used to purify compounds that can decompose before reaching their boiling point at atmospheric pressure. By reducing the gas pressure above a liquid, that liquid can be made to boil at a lower temperature. The overall technique of alcohol distillation can be summed up into 3 parts they are fermentation, distillation, and finishing. Fractional Distillation (FD) membrane leads to a better separation than simple distillation because the glass beads in the fractionating column provide theoretical plates on which the vapors can condense and then re-evaporate, essentially distilling the compound many times. A reduced vacuum pressure distillation membrane is performed at a reduced pressure using a water aspirator. Since the boiling points of liquids are depressed at reduced pressure, organic compounds can be distilled at lower temperature. It is also can be referred to as low temperature distillation. Vacuum distillation membrane is frequently used in large industrial plants as an efficient way to remove salt from ocean water, in order to produce fresh water this is known as desalination.

The ocean water is placed under a vacuum to reduce its boiling point and has a heat source applied, and allowing the fresh water to boil off and be condensed. The condensing of the water vapor prevents the water vapor from filling the vacuum chamber, and allows the effect to run continuously without a loss of vacuum pressure. The heat from condensation of the water vapor is removed through a heat sink, which uses the incoming ocean water as the coolant and thus preheats the feed of ocean water. Some kind of distillation membrane does not use condensers, but instead compress the vapor mechanically with a pump. This acts as a heat pump, concentrating the heat from the vapor and allowing for the heat to be returned and reused through the incoming water source. There are various types of Vacuum Distillation (VD) of water, with the most common being multiple effect distillation, vapor compression desalination, and multi-stage flash distillation.

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