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Distillation of Alcoholic Beverages Abstract We used a Quickfit Set Up in order to perform a Simple Distillation procedure. We used 15mL of The Bar as our distillate. We separated and calculated the alcohol content of the said beverage by the distillation process. Introduction Alcoholic beverages are undeniably part of our culture for a long time already. It has many purposes, like, medical, hygienic, recreational. But, like everything else, if taken excessively, that is a different story. Because of that, many laws in different countries are made for the regulation of the consumption of the said beverages.

An alcoholic beverage is a drink containing ethanol, commonly known as alcohol. Alcoholic beverages are divided into three general classes: beers, wines, and spirits. They are legally consumed in most countries, and over 100 countries have laws regulating their production, sale, and consumption. [1] In particular, such laws specify the minimum age at which a person may legally buy or drink them. This minimum age varies between 16 and 25 years, depending upon the country and the type of drink. Most nations set it at 18 years of age.

Now, how is this alcohol in these beverages produced? There is a process called fermentation, in which chemical breakdown of a substance is aided by microorganisms by converting grain starch into sugar (for beer). This is left to ferment for several days, and then there comes your beer. For other drinks like whisky, these are made by distilling fermented drinks. Distillation is a method used to purify a compound by separating it from its less-volatile component, especially differences in boiling point. To determine the boiling point for organic compounds is not as routinely done ompared with the

melting point, but it is equally important for purification process. Vapour pressure is exerted by liquids as a result of molecules leaving the surface of the liquid to become vapour. The boiling point is the temperature at which the vapour pressure of the liquid equals external, atmospheric pressure acting on the surface of that liquid. As a rule of thumb, compounds with higher vapour pressures will boil at lower temperatures. In distillation, the vapour temperature which is in equilibrium with the boiling liquid is the temperature recorded rather than the distilling flask temperature.

Here are the types of distillation, Simple and fractional, and Steam Distillation. In simple distillation, the distillate would contain predominantly one liquid but would still be admixed with a second component. To further separate this resulting distillate, it should be redistilled. While fractional distillation is the separation of a mixture into its component parts, or fractions, such as in separating chemical compounds by their boiling point by heating them to a temperature at which several fractions of the compound will evaporate.

And, steam distillation is a distillation in which vaporization of the volatile constituents of a liquid mixture takes place at a lower temperature by the introduction of steam directly into the charge; steam used in this manner is known as open steam. Results and Discussion Sample: The Bar Volume of sample: 15 mL Simple Distillation Set-up Test tubeVolume (mL)Temperature (°C)Flammability 10. 030. 0+ 0. 577. 0 20. 580. 0+ 30. 583. 0+ 40. 584. 0+ 50. 586. 0+ 60. 588. 0+ 70. 588. 0+ This table shows the result of the boiling temperature and flammability test for the Simple Distillation Set-up.

In the flammability test, all of the distillates were flammable. The maximum temperature reached is 88. 0 °C. At first, the temperature rises quickly, and as it progresses, the rise of temperature slows down. In test tube 1, the temperature is 77. 0 °C. In test tube 2, the temperature is 80. 0 °C. In test tube 3, the temperature is 83. 0 °C. In test tube 4, the temperature is 84. 0 °C. In test tube 5, the temperature is 86. 0 °C. In test tube 6, the temperature is 88. 0 °C. In test tube 7, the temperature is 88. 0 °C. Calculations: % Alcohol = Volume flammable x 100

Volume of the Sample % Alcohol = 3. 5mL x 100 15mL % Alcohol = 23. 34 % This graph shows the result of the boiling temperature and flammability test for the Simple Distillation Set-up. In the flammability test, all of the distillates were flammable. The maximum temperature reached is 88. 0 °C. At first, the temperature rises quickly, and as it progresses, the rise of temperature slows down. In test tube 1, the temperature is 77. 0 °C. In test tube 2, the temperature is 80. 0 °C. In test tube 3, the temperature is 83. 0 °C. In test tube 4, the temperature is 84. °C. In test tube 5, the temperature is 86. 0 °C. In test tube 6, the temperature is 88. 0 °C. In test tube 7, the temperature is 88. 0 °C. Experimental A Quickfit distillation was set-upped (composed of 2 sets of clamps, iron stand; the rubber tubes were placed in the condenser; the Quickfit joints were greased). The test tubes were pen-marked at the 0. 5mL volume. 15mL of sample beverage (The Bar) and two pieces of boiling chips were placed in the distilling flask. The flask was heated with a Bunsen flame that was constantly rotated around the flask. . 5mL of the distillate were collected in separate numbered calibrated test tubes. Temperature was recorded when each fraction was collected. The set up was cooled down and

the remaining liquid from the distilling flask was poured into the graduated cylinder and the volume was recorded. The readings were plotted.

References Garcia, C. (2005). Laboratory Experiments in Organic Chemistry. University of Santo Tomas, College of Science. Manila. Chang, R. , & Overby, J. (2011). General Chemistry 6th Edition. McGraw Hill. New York, USA.