Molecular polarity essay

These experiments helped us understand the importance of molecular polarity. This knowledge can now be used for the future to predict, for example, if two substances will mix or not. We can now do this by knowing that polar substances only mix with other polar substances, while non-polar substances only mix with other non-polar substances. This concept can be used to predict if a substance will be soluble in a specific solvent.

The concepts of solubility and conductivity of a substance were studied as well in this experiment helping us understand how the various molecules and its ions react in solvents. An example of this process is when calcium chloride dissolved in water. The polar water molecules attracted the oppositely charged Ca2+ and Cl- ions as calcium chloride is a polar molecule as well. The ions brake apart as the water attraction is greater than the ionic bond within the calcium chloride molecule. Solubility is also important for conductivity as some elements such as calcium chloride do not conduct in a solid state. This explains why calcium chloride conducted when dissolved in water and ethanol, but didn’t in hexane as it did not dissolve.

Hence, the last concept faced in this experiment was the movement of ions or electrons which determine conductivity. In some conductivity results in table 7, a couple of results were extremely odd as no free electrons should have been present (see evaluation). Evaluation: Precision was not fundamental for this lab but most, if not all the 7 experiments had possible limitations and sources of error which might have affected the data results/analysis. The distilled water apparently absorbed ions present in the surrounding atmosphere (see conductivity experiment). In the first experiment a possible source of error was the force of the water, ethanol or

hexane streams. If one stream flows more strongly than the other, the bending movement towards the charged rod might be compromised, therefore it was important to keep the same, low pressure for all three liquids.

When a stopper was used to block a test tube, that stopper might have been dirty or used to mix another substance. This might explain the white foam when mixing water and the iodine crystal, and why it is important to be sure they are clean before use. During the graphite experiment, it was extremely hard to determine whether it was soluble in water, ethanol and hexane is it was in the form of an extremely fine powder. If one used too much of it, the whole solution might have become completely black which would make it impossible to distinguish the grains with the solvent.

One must use a limited amount of graphite in order to record proper data. During experiment 5, when adding the AgNO3, some groups recorded that the white precipitate formed also in the test tube containing hexane and the undiluted calcium chloride. The only explanation for this is that AgNO3 was diluted. If such a result occurs, it is important to understand chemically what happened since it cannot be prevented. The last experiment (7) had the most distorted results.

One of the possible sources of error could be that the conductivity tester might have been dirty or its battery might have been dead. This is why it is important to test it with a substance that you know is conductive. The tray was extremely small and the holes in which the solutions were placed, were very small and closely placed together. Therefore, when poring the various

solutions, one or two might have mixed together greatly compromising their conductivity. It is important to be careful when poring the substances, maybe it would be best to use a pipette.

The conductivity tester’s metal receptors might have been dirty therefore affecting the conductivity of a solution. Looking at experiment 7, it is noticeable that all the water based solution conducted such as when mixed with iodine and graphite. Chemically it is not possible that pure water conducts electricity and both iodine and graphite are not soluble, therefore chemically speaking, it is impossible that those two solutions conducted electrical currents. The only two solutions that should have conducted were calcium chloride with water and calcium chloride with ethanol, since calcium chloride does not conduct in a solid state, but does in a liquid state (diluted). It is important to isolate the distilled water from any possible atmospheric absorption which would affect the presence of ions, responsible for the conductivity.