Reaction alkali metals and alkaline earth metals essay sample

The rates of reaction of Alkali metals and Alkaline Earth meatals are compared in this lab. The pH of each of the ensuing metal solutions are tested and the merchandises of the reaction between Ca and H2O is discovered. The tried elements are sodium.

Li. K and Ca and each of them were placed in a beaker filled with H2O. The resulting solutions pH degrees were tested with litmus paper. There were more stairss for caclium because it is the lone Alkaline Earth metal. For Ca. the gas produced in a trial tubing by the downward supplanting of H2O was collected.

Then. the trial tubing was lifted out of the H2O and kept in an upside-down place. Finally. the gas collected was tested by conveying a firing splint to the oral cavity of the trial tubing. It was concluded that the Alkali metals were more reactice than the Alkaline Earth metals.

When the active metals reacted with H2O. the resulting solutions were basic. Hydrogen gas was produced when Ca reacts with H2O. IntroductionAlkali metals are in the first column of the periodic tabular array and they may be readily fused and volatilized with their thaw and boiling points going lower with increasing atomic mass. They are the strongest positively charged metals. (Kerrod.

R. 2009) These elements react smartly. even violently with H2O. Alkaline Earth metals are elements in the 2nd column of the periodic tabular array. These elements are in general white. differing by sunglassess of colour or dramatis personaes ; they are ductile.

extrudable and machinable. (Tutor Vista. 2008) Besides. these elements are less reactive than the Alkali metals and have higher runing points and boiling points.

The ionisation energy is the sum of energy it takes to detach one negatron from a impersonal atom. The IE addition from bottom to exceed and left to compensate in the periodic tabular array. (The Shodor Education Foundation. Inc.

2000) The IE and atomic radius addition in opposite waies. This makes sense because as the atom gets smaller. the valency electrons become closer to the karyon. This means the attractive force keeping the negatron is stronger and it takes more energy to draw the negatron away.

The ionisation energy of an atom is equal to the sum of energy given off when an negatron is added to an atom. Unlike a ball. an atom doesn’t have a fixed radius. The atomic radius of an atom can be obtained by mensurating the distances between atoms in chemical compounds. The atoms are pulled closely together and so the mensural radius is less than if they are merely touching. (Clark.

J. 2004) This is what you would acquire if you had metal atoms in a metallic construction. or atoms covalently bonded to each other. As mentioned antecedently. the atomic radius lessening in traveling from left to compensate across a period. This lessening can be explained in footings of the increasing effectual atomic charge (decease screening) in traveling from left to compensate.

This means that the valency negatrons are drawn closer to the karyon. diminishing the size of the atom. Atomic radius increases down a group. due to the additions in the orbital sizes. When a metal oxide reacts with H2O.

they create a basic solution. Therefore. when the Alkali metals and Alkaline Earth metals react with H2O. a basic solution is produced. In add-on. the term “ Alkali” (basically the antonym of an acid) refers to a substance that forms the negatively charged hydrated oxide ion (OH?) in contact with H2O.

(Kerrod. R. 2009) Alkali metals and Alkaline Earth metals are known for their vigorous reactions with H2O. and these reactions become progressively violent as one moves down the group. The reaction with H2O is as follows: Alkaline Earth metal + H2O > Alkaline Earth metal hydrated oxide + H gas. Materials & A ; ApparatusApparatusMaterials600 mL beakertest tubewooden splintswire gauzewatch glasstweezersscoopula Li metalsodium metalpotassium metalcalcium metalred and bluish litmus paperProcedurePart A- Reactions of Alkali Metallic elements with WaterBeaker was half filled with H2O.

Wire gauze was placed on top on the beaker. Pincers were used to drop Na into a beaker half-filled with H2O. Beaker was instantly recovered with wire gauze. When the reaction was complete.

the contents of the beaker were tested withruddy and bluish litmus paper. The beaker contents were disposed. Thesiss stairss were repeated with Li and K. Part B- Reactions of Alkaline Earth Metallic elements with WaterBeaker was rinsed and half filled wih fresh H2O.

A trial tubing was filled with H2O and inverted into the beaker. A sampe of calium was obtained utilizing a ticker glass. The Ca was added to the beaker. The gas produced by the reaction was collected in a trial tubing by the downward supplanting of H2O. When the trial tubing was full. the trial tubing was lifted out of the H2O and kept in a N inverted place.

The gas collected was tested by conveying a firing splint to the oral cavity of the trial tubing. The solution was tested with ruddy and bluish litmus paper. ResultsSodiumCreated little bubblesDissolvedBurst into flameHissing noiseLiquid is basicLithiumCreated medium bubblesDissolvedHissing noiseLiquid is basicPotassiumPopping soundHissing noiseLots of smokeBurst into violet flameLiquid is basicCalciumBalls of Ca dissolved into a semitransparent solution. Liquid is basicMade a starting sound when the combustion splint went into the trial tubing. Hydrogen gas is produced. DiscussionAll of the theories discussed in the debut on first ionisation energy.

atomic radius and metal oxides have all been proven in this lab. Alkali metals are much more reactive than Alkali earth metals and this is due to ionization energy and atomic radius. The Alkali metals rates of reaction addition as you go down the periodic tabular array and this is besides explained by ionisation energy and atomic radius. Metal oxides react with H2O to bring forth basic solutions and this is due to their chemical equation. Alkali metals produce H gas when they react with H2O due to the chemical equation and Alkali metals with oxides create basic solutions due to the oxides and H2O regulation.

Sodium. Li and K were much more reactive than Ca was and this is due to ionization energy and atomic radius. Due to a really big size of the atoms. Alkali metals have really low ionisation energies. Down the group the ionisation energy lessenings as atomic size additions. This is due to new shells being added and the addition in the magnitude of the testing consequence of inner shell negatrons.

(Chem 1. 2005. November 14) Members of Alkaline Earth metals have higher ionisation energies values compared to Alkali metals because of their smaller size. with the negatrons being more attracted towards the karyon of the atoms. The less attracted the negatrons of an component are to their karyon. the more reactive an component is because it is more willing to take part in reactions.

As you go down the Periodic tabular array. the responsiveness of the Alkali metals additions and this is due to ionization energy and atomic radius. The lower the ionisation energy. the more willing an Alkali metal is to lose an negatron. The larger the atomic radius.

the less important each negatron becomes and hence. the lupus erythematosus of a job it is for an Alkali metal to lose one. Each component in the Alkali metal group. and in every group for that affair. becomes more reactive because they are more willing to lose negatrons and hence more willing to take portion in chemical science. The definition of Alkaline is a non acidic solution.

therefore it is non surprising that all of the solutions were basic. When Alkali metals react with H2O. one H atom splits off from the H2O molecule to

organize H gas. while the other H atom joins the O to organize hydrated oxide. (Kerrod. R.

2009) This besides explains why all of the solutions were basic because the hydroxide ion was present in all of the solutions. The presence of a hydroxide ion is the figure one manner to look into for a base and this gets formed when one of the H atoms splits off from the H2O molecule to organize hydrated oxide. Five factors that could hold cause experimental mistake are concentration. temperature. medium.

accelerators. and surface country. A higher concentration of reactants leads to more effectual hits per unit clip. which leads to an increasing reaction rate (except for nothing order reactions) . Similarly.

a higher concentration of merchandises tends to be associated with a lower reaction rate. (Helmenstine. A. 2009) Normally. an addition in temperature is accompanied by an addition in the reaction rate.

Temperature is a step of the kinetic energy of a system. so higher temperature implies higher mean kinetic energy of molecules and more hits per unit clip. The rate of a chemical reaction depends on the medium in which the reaction occurs. It may do a difference whether a medium is aqueous or organic ; polar or nonionic ; or liquid. solid.

or gaseous. (Purchon. N. 2006.

Novemeber 10) Catalysts work by increasing the frequence of hits between reactants. changing the orientation of reactants so that more hits are effectual. cut downing intramolecular bonding within reactant molecules. or

donating electron denseness to the reactants. Surface are can besides act upon the rate of reaction because the types of molecules can merely knock into each other at the liquid solid interface.

i. e. on the surface of the solid. Therefore. the larger the surface country of the solid.

the faster the reaction will be. DecisionThe Alkali metals were more reactice than the Alkaline Earth metals. When the active metals reacted with H2O. the resulting solutions were basic. Hydrogen gas was produced when Ca reacts with H2O.

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