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Pamela Franco Marani, Thais Andressa Lopez de Oliveira, Marilde Beatrice Sorzi Sa Definition of student concepts is fundamental to the learning process, because knowing them can plan and organize activities that will be developed with students. With this in mind, it is part of the results of the study, which aims to analyze the concepts of high school students about factors that change the rate of chemical reactions, in particular, discussing concepts about the impact of the contact surface and temperature. The study involved 26 second-grade students from Parana High School. The data were collected through the researcher's field diary and questionnaire, citing the performance of the experiment, and analyzed according to bardin's analysis of the content. The responses were grouped into eight categories, which revealed empirical descriptions in which students could find that students had difficulty with the practices observed in the experiment with content learned in the classroom, in addition to showing difficulties in reasoning and writing. Mechanical learning has become apparent, which forces students to memorize factors that change the speed of reactions without a true understanding of content, as most students have presented difficulties in relation to kinetic energy and effective collisions, as well as in justifying the influence of the contact surface. With that said, it is obvious that the importance of knowledge of students' difficulties is important, because this recognition can outline appropriate didactic strategies to improve the study of chemistry concepts. Alternative concepts; Teaching Chemistry; Contact surface; DOI Temperature: 10.3895/actio.v2n1.6777 Copyright 2018 CC-BY This work is licensed under the Creative Commons Attribution 4.0 International license. ACTIO takes CC-BY 4.0 Creative Commons Social Media Licensing: You are in material support for the Chemical Kinetics We can observe that some chemical reactions occur faster and others are slower. Not every chemical reaction occurs at the same time. It takes hours, days, years. Others take a fraction of a second to happen. Chemical reactions occur at different speeds, such as the process of digesting food, which takes several hours, and the explosion, which is instantaneous. See some chemical reactions: - acid and the base of instant reaction; The formation of rust, the formation of which takes years; - dissolution of effervescent tablets, which takes a few seconds; - which often takes billions of years; Burning a candle that takes several hours; - Burning a match that takes a few seconds; Rock formation that takes several million years. Sometimes it is important to control these reactions by making them faster or slower. Chemical kinetics is an area of chemistry that studies the speed of chemical reactions and factors that change this velocity. How to refer: Chemical kinetics in So. Virtuous Information Technology, 2008-2020. Consultation 10/20/2020 at 22:47. Available online in Pamela Franco Marani, Thais Andressa Lopez de Oliveira, Marilde Beatrice Sorzi Sa Revealing the concepts of students is fundamental to the learning process, because knowing them can plan and organize activities that will be developed with students. With this in mind, it is part of the results of the study, which aims to analyze the concepts of high school students about factors that change the rate of chemical reactions, in particular, discussing concepts about the impact of the contact surface and temperature. The study involved 26 second-grade students from Parana High School. The data were collected through the researcher's field diary and questionnaire, citing the performance of the experiment, and analyzed according to bardin's analysis of the content. The responses were grouped into eight categories, which revealed empirical descriptions in which students could find that students had difficulty with the practices observed in the experiment with content learned in the classroom, in addition to showing difficulties in reasoning and writing. 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It takes hours, days, years. Others take a fraction of a second to happen. Chemical reactions occur at different speeds, such as the process of digesting food, which takes several hours, and the explosion, which is instantaneous. See some chemical reactions: - acid and the base of instant reaction; The formation of rust, the formation of which takes years; - dissolution of effervescent tablets, which often takes billions of years; Burning a candle that takes several hours; - Burning a match that takes a few seconds; Rock formation that takes several million years. Sometimes it is important to control these reactions by making them faster or slower. Chemical kinetics is an area of chemistry that studies the speed of chemical reactions and factors that change this velocity. How to refer: Chemical kinetics in So. Virtuous Information Technology, 2008-2020. Consultation 10/20/2020 at 22:47. Available online in - Chemical Reaction Speed - Contact Surface and Chemical Reaction - Temperature and Chemical Reaction Goals - Introduction of Chemical Kinetics Research - Identify factors that change the reaction rate of Stage 1: Beginning conversation Materials and substances are objects of science called chemistry and its study can be done at three points: constitution, properties and transformation. Thinking about the aspect of transformation, chemical kinetics is an area that studies the speed of chemical reactions and the factors used to control it. The purpose of this lesson plan is to present to the student the factors that contribute to changes in the rate of chemical reactions. Step 2: Virtual Learning Object - Chemical Kinetic in the second stage, students will use virtual object learning (OVA) Chemical Reactions - Chemical Kinetics. (FIGURE 1) Figure 1. OVA Chemical Reactions Start Screen - Chemical Kinet 1 Dear Teacher, if you are having difficulty opening an OVA, use a different browser. If problems persist, follow the following instructions from the Wikihow website. After tightening the play, a scientist named Professor Xavier will explain the purpose of the experiments to be conducted by OVA (Figure 2). Figure B Figure 2. Virtual Laboratory: A - Presentation by Professor Xavier; B - description of chemical kinetics. After the description, experiment 1 - The first part is the orientation of the design (Figure 3A). Figure 3B shows that the type of solid (insert) and the number (two) are the same for each glass, changing the temperature: 50 oC for one glass and 85oC for another glass. B C D Figure 3. Experiment 1 - Temperature effect: A - Orientation of the procedure; B - Performing the experiment at different temperatures, keeping other variables equal; C - Visualization of the rash; D - The question of experimentation. After clicking on the game, the solids will play in the glass and the bubble process (FIGURE 3C) will begin. In the simulator, you will notice that the experiment with a higher temperature will have a higher bubble speed, which indicates a greater speed of reaction. The experiment can be repeated several times, changing the amounts, types of solids (as long as the same remains for two glasses) and temperature (being helpful to spill in each glass). At the end, the question will be presented to the student for reflection on what he/O'3D. The first screen of Experiment 2 - Concentration is the orientation of the design (Figure 4A). In figure 4B, you can fall asleep that the type of solid and temperature are the same for both beadleters, changing only the amount soluble. B C D Figure 4. Experiment 2 - Concentration effect: A - Orientation of the procedure; B - Adding different amounts of solids, keeping other variables equal; C - Bubble visualization; D - The question of experimentation. Then the solids will be thrown into the glass and start the bubble process (FIGURE 4C). In the simulator you will notice that the glass with a higher concentration will have a higher bubble speed, which indicates a greater speed of reaction. At the end, the question will be presented to the student for reflection on what he/she achieved (FIGURE 4D). For experiment 3 - Contact Surface, the procedure of previous experiments is repeated, changing in each glass the type of solid (in one insert and in another powder), but remaining equal to the amount of solid and temperature (FIGURE 5). B C D Figure 5. Experiment 3 - Contact Surface Effect: A - Procedure Orientation; B - Adding different types of solid, keeping other variables equal; C - Bubble visualization; D - The question of experimentation. Step 3. At the end of the lesson, the teacher can do some exercises with the students. Here are a few suggestions with their answers. 1. (Udesc-SC) Chemical kinetics is an area of chemistry that deals with reaction rate. Analyze the processes associated with chemical kinetics. I. When coal starts to burn, people ventilate So the burn spreads faster. II. The effervescent tablet dissolves faster when shredded. Separate an alternative that contains factors that influence the rate of chemical reactions in the processes described in I and II, respectively. Concentration, contact surface. b) catalyst, concentration. c) temperature, concentration. d) Contact surface, catalyst. (e) Temperature, catalyst. Correct answer: A 2. (PUC-RS / Adapted) To link the phenomena described in Column I with the factors affecting its speed mentioned in Column II. Column I - Burning spreads rapidly when it is windy; 2 - Keeping food in the fridge; 3 - Shards of wood burn faster than a wooden shard. Column II A - contact surface; B - concentration; C - temperature. The alternative that contains the correct link between the two columns is a) 1 - B; 2 - A; 3 - K. b) 1 - C; 2 - B; 3 - A. c) 1 - A; 2 - B; 3 - C. d) 1 - B; 2 - C; 3 - A. e) 1 - C; 2 - A; 3 - B. Correct answer: D 3. (Mc Sp) One student, eager to test the concept of chemical kinetics discussed at school, went to the pharmacy and bought a few effervescent tablets that contained, according to the product label, equal masses of baking soda. Upon arrival at your home you made a mixture of these water tablets using different methods. After observing the phenomenon of gas release, until the entire mass of each tablet dissolved in the water, the student made the following table: according to the results obtained and shown in the table, the student made the following statements: I. When comparing only methods 1 and 2 it is impossible to determine which of the two different factors (the condition of the tablets and the temperature of the water) further increased the speed of the reaction. II. Changing the state of the water, from cold to hot, causes, regardless of the condition of the pill, the reaction rate to fall twice. III. The effect of water temperature is greater than the effect of the pill condition on the increased reaction rate. Of the above statements, it is correct to say that the student has made a mistake: (a) only in statement I. (b) only in Statement II. (c) only in Statement III. (d) only in statements II and III. e) in all statements. Correct answer: B Related MaterialsIt is recommended that the teacher access some preliminary material to learn a little more about chemical kinetics and reaction rate: 1 - Contextualization in the training of chemical kinetics. Access to June 24, 2018. 2 - Didactic models and chemical kinetics. Access to June 24, 2018. 3 - Concepts of chemical kinetics: Temperature and contact surface. Access to June 24, 2018. 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