Reaction Rates:
When Surface Area Matters!

Student quiz — Answer key

Directions: Choose the best answer for each question below.

1. You have different Alka-Seltzer tablets®, all having the same mass. How is the final particle size of each tablet related to its combined surface area?

   a. The total tablet surface area increases with smaller particle size
   b. A tablet with bigger particles has a higher combined surface area
   c. Particle size and surface area are not related
   d. The smaller the particles of the tablet, the lower its total surface area

2. This table shows reaction rates recorded for four different broken-up tablets. Other than particle size, all other factors were the same in the four reactions, including temperature and tablet mass. Which statement is true?

Tablet	Reaction rate [g/s]
A	0.05
B	0.12
C	0.075
D	0.1

   a. Combined surface area tablet A < tablet D
   b. Particle size tablet B < tablet C
   c. Combined surface area tablet B > tablet A
   d. All of the above
   e. None of the above

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3. What determines if a reactant collision results in a successful product formation?

   A. Surface area of the reactants

   B. Orientation of the reactant molecules

   C. Energy of the collision

   D. Molecule size of the product

   a. A and C
   b. B and C
   c. A and D
   d. A, B, C and D

4. You got this data when dissolving three different brands of effervescent tablets in water. Which dissolution reaction happens at the fastest rate?

Tablet brand	Tablet mass [g]	Reaction time [s]
1	1	10
2	1.5	30
3	2	10

   a. Brand 1
   b. Brand 2
   c. Brand 3
   d. Brand 1 and 3

5. The surface area of a solid reactant affects the chemical reaction rate because according to the Collision Theory a higher surface area…

   a. …increases the particles size of the reactant
   b. …increases the energy of the reactant molecules
   c. …increases the number of successful reactant collisions
   d. All of the above