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Cleaning up Acid Spills

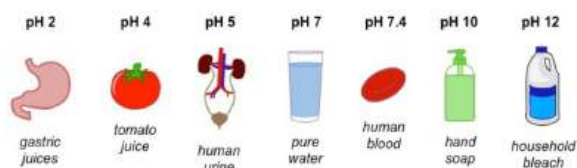
pH¹ is a scale from 0 – 14 that is used in chemistry to find out if a chemical is an acid, a base, or neither. pH tells us how acidic something is, with 0 being the most acidic. A chemical with a pH of 7 is **neutral**². Pure water, for example, has a pH of 7. An **acid**³ is a chemical with a pH

Did You Know?

People use hydrochloric acid to control the pH of their swimming pools.



Examples of pH Conditions:



The pH scale goes from 0 to 14.

they touch. Some acids easily catch fire while others can make you sick if you breathe them in. Because of this, if an acid is spilled, it can be very dangerous to humans, animals, buildings, and the environment.

below 7 and a **base**⁴ has a pH above 7. Combining an acid and a base causes **neutralization**⁵ to occur. Neutralization means making something neutral. The goal of neutralizing an acid or base is to get the pH closer to 7.

Acids are **corrosive**⁶, meaning that they quickly break down things that



Acid is corrosive.



Hazmat suits are a type of PPE.

How is an acid spill cleaned up?

First, people must wear proper **personal protective equipment**⁷ (PPE) when cleaning up an acid spill. This includes goggles, a lab coat or apron, gloves, and an air-cleaning mask if breathing in the acid is dangerous. Workers first control the spill using something that absorbs it like a sponge so that it doesn't spread. They may use special spill pillows and pads that are made for chemical spills. Once controlled, they neutralize the acid by adding a weak base. Such a base could be soda ash, sodium bicarbonate, or calcium carbonate. There are also special acid neutralizers. They must add the

¹ **pH**: a scale from 0-14 that is used in chemistry to find out how acidic something is.

² **Neutral**: something with a pH of 7; for example, pure water.

³ **Acid**: something with a pH below 7; can be dangerous for people, animals, and the environment.

⁴ **Base**: something with a pH above 7.

⁵ **Neutralization**: making something neutral, getting its pH near 7.

⁶ **Corrosive**: substances are corrosive if they quickly break down things that they touch.

⁷ **Personal protective equipment**: anything that protects someone's body from damage, like goggles, lab coats/aprons, gloves, masks, and hazmat suits.

Ecobottle Sample



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Large-scale acid cleanups

Case Study #1: In Stillwater, Oklahoma, in August of 2016, one gallon of hydrochloric acid fell off a truck and burst in the road. The local fire department came out, tested the pH of the acid, and then treated it with soda ash. They kept adding soda ash until the pH was near neutral. Then they washed the neutralized chemical off the road.

Case Study #2: In Lancaster County, Pennsylvania, in June of 2014, four 5-gallon buckets of hydrochloric acid were damaged inside a tractor-trailer when the driver had to slam on his brakes. About two gallons of acid leaked out of the truck onto the parking lot of a bookstore when the driver stopped to make a delivery. Local firefighters and a hazmat (hazardous materials) team used an absorbent to keep the spill from flowing more than 12 feet away from the truck and soak it up. Because of the quick response, they kept the acid from running off into a nearby creek.



Hydrochloric acid is very corrosive.

Case Study #3:

Ecobottle Sample



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Reading Comprehension Questions:

1. If a
2. If complete neutralization occurs, what will the pH be?
3. Why
4. What is used to control an acid spill?
5. What
6. What was the main difference between the spill in Stillwater and Jones County and how did this affect the way the responders acted?

Extension Questions:

7. Create an
8. What if a base spilled? How would it be cleaned up?

Ecobottle Sample



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TWESAY

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