Pill Solubility

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The purpose of our experiment was to determine how the coating of a pill affects the rate at which a medicine enters the bloodstream. To represent the digestive process we used hydrochloric acid (.1 M and 1x10^-5 M) as the stomach acid and small intestine, respectively. Our control was distilled water which would represent a pill that hadn't been swallowed. The experiment was at a school lab with a teacher supervisor. To do this experiment we heated each liquid to the temperature of the human body (37 degrees C) using a hot plate. We used magnetic stirrers to keep the pills moving, and timed how long it took the pill coating to dissolve. We used four types of acetaminophen, soft gels, gelcaps, tablets, and compressed caplets. We did several trials for each substance and pill. Based on our experimentation and research we concluded that the compressed caplets were designed to dissolve in the small intestine, and each of the other pills was designed to dissolve in the stomach. The tablets, which had no coating dissolved the fastest, but because that had no coating much of the medicine would be lost to the strong acid of the stomach before being absorbed into the bloodstream.

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