Crystal Drano

According to the National Institutes of Health's Household Products Database, the crystal form of Drano is composed of sodium hydroxide (30-60%), sodium nitrate(15-40%), sodium chloride(7-13%) and aluminum(1-5%).

The power crystals are simply colored salt, and are the least powerful ingredient. The crystallized lye (NaOH) reacts with fats to form soap. The machined shards of aluminum react with lye to generate near-boiling temperatures. The sharp shards in the hot churning lye physically cut hair and dislodge deposits. Several chemical reactions take place.

1. When Drano is added to water, the sodium hydroxide, sodium nitrate and sodium chloride dissolve. The heat of solution liberated when sodium hydroxide is dissolved warms the mixture.

2. In solution, sodium hydroxide reacts with aluminum to liberate nascent hydrogen, which is a powerful reducing agent. This reaction is exothermic and the heat can cause the mixture to boil. The chemical reaction consists of two steps:
    a. (breakdown of aluminum oxide) $Al_2O_3 + 2NaOH + 3H_2O \rightarrow 2Na[Al(OH)_4]$
    b. (oxidation of aluminum metal) $2Al + 2NaOH + 6H2O \rightarrow 2Na[Al(OH)_4] + 3H_2$

3.

Crystal Drano was invented in 1923 by Harry Drackett.