

The Liquid Bandage: Patterns of Chemical Structure



"The only difference between a problem and a solution is that people understand the solution"

In recent articles in Chemical and Engineering News (June 16, 2008, p11, p61; www.cenonline.org), the technology and history of what we now know as the liquid bandage was reviewed, as well as reviews of chemical structures. Some important TRIZ principles were obvious in these discussions

The development of liquid bandage technology is a move along the field evolution line that we use--mechanical, thermal, chemical, and on to electronic and electromagnetic. It also illustrates the principles of upward system integration and use of resources. The mechanical aspects of the bandage are performed by the skin itself without the need for a mechanical strip, which forms "itself". The article points out that prior to the development of polymers such as poly(N-vinylpyrrolidone), acrylates, and silicones, humans used honey, sorghum, and tree sap. Battlefield versions of such products utilize cross linking polyvinyl alcohol products that are mixed together in much the same way as Crazy Glue. The article also describes adding useful complexity (another basic TRIZ principle) by adding anti-bacterial or skin matching color chemistry.

What would we predict would come next? From the standpoint of several lines and patterns, we would expect the following developments over time. First, additional dynamism. The development of chemistry that would be specific and helpful to the nature of the wound, similar to the trend we've seen developing in adult vitamins (different formulations based on age and sex). Second, cure time that might be also responsive to the external or medical conditions. This might be controllable by the user of the bandage. What about moving along the TRIZ field line? An additional chemical field, similar to what is used in the military version, will be developed that will be safe enough for normal consumers to use. Also, the use of electrical and magnetic fields to enhance the curing chemistry or make it specific to a given condition. Portable sterilization, similar to what is now on the market for small drinking water quantities should appear. Upward system integration might suggest oral products that would go the site of the wound and perform chemistry. Using negative resources, discussed in these newsletters before, might allow the bleeding, which we are normally trying to prevent, as a positive resources from a chemistry standpoint combining with chemistry in the applied liquid bandage.

In this same issue, there was a discussion of the first attempt to organize the use of chemical shapes in molecules. This is the very beginning of organizing chemical structures similar to what Altshuller did for mechanical and engineering systems. A lot more needs to be done to link this information with functionality, but it's a start toward applying the principles of TRIZ thinking to chemical structure and synthesis.