



Shepherd Chemical Case Study #14

Product Area: Inorganic Salts

Chemical: Cobalt Hydroxide

A customer approached the Shepherd Chemical Company seeking the development of Cobalt Hydroxide for a specialized battery application. A range of specifications were provided by the customer which encompassed physical properties, composition, and purity level.

The Shepherd Chemical team reviewed the program with respect to the customer's commercial and technical targets and developed a plan for the synthesis of samples meeting the customer's requirements. During the project review the Shepherd team provided an assessment of the likelihood of achieving the target compounds in the laboratory and on the large scale. Furthermore, an assessment of the expected commercial pricing was reviewed to insure that the project was moving forward with realistic economic assumptions.

Once the project scope was developed and there was an agreement on the commercial aspects of the project, the Shepherd Chemical team began synthesis of several compounds meeting the customer's stated targets. Once synthesized, the Shepherd's R&D Characterization team assessed the key physical and compositional properties of each sample that was sent to the customer including:

- Particle Size Distribution
- SEM imaging
- Density
- Surface area
- Trace impurity levels
- X-Ray diffraction pattern
- Thermogravimetric analyses



Shepherd Chemical sent a complete analyses along with each laboratory generated sample. The customer received each of the lab samples and began their in-use evaluation of the samples. Following this cycle (sampling-evaluation), Shepherd Chemical and the customer had a technical review to evaluate which of the samples gave the best performance in the application.

Shepherd Chemical then developed a proposal to make multiple pilot scale batches of the customer's chosen samples. In this particular case, the customer chose two different formulations for initial scale-up. Shepherd Chemical designed processes to make these compounds on a 20 kg scale and provided the customer with a proposal that outlined the resources and timing for a pilot scale batches.