Covey Consulting Pty Ltd

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Calcium Hypochlorite

COVEY CASE STUDY

Ever since the introduction of electrolytic methods to manufacture sodium hydroxide and chlorine there has been a see-saw market demand for the two co-products, with one or the other being in higher demand and new uses sought for the other.

With public concerns about chlorinated organics and the resulting reduction in the use of elemental chlorine and hypochlorite in pulp bleaching led to a surplus of chlorine availability that continues to this day.

One of our clients was offered the surplus chlorine produced by a chlor-alkali plant and engaged Covey Consulting to try to find a profitable market for a chemical manufactured from it.

We conducted a survey and found that the most promising use was to produce solid calcium hypochlorite. This is widely used as 'pool chlorine' and more importantly in the treatment of municipal waste water. However, this does not solve the sodium hydroxide-chlorine imbalance because the most common methods of making calcium hypochlorite use equivalent amounts of chlorine and sodium hydroxide (these methods became popular when it was sodium hydroxide that was available as a surplus).

Our researches discovered an older method of making calcium hypochlorite from calcium hydroxide and chlorine only, by a three-stage process. This process had fallen into disuse when cheap sodium hydroxide had favoured simple processes. Very little was published on any of the manufacturing processes, but by careful analysis of the available information together with some experimental work we were able to develop a sodium hydroxide-free process that could produce calcium hypochlorite at a lower cost than conventional methods.

We further refined the process to avoid the use of titanium as the major construction material as used in most traditional plants. Instead we found that polymers and cheaper alloys could be used in most parts of the plant. This greatly reduced the projected capital cost and further improved the profitability of the project.

Unfortunately, at this point, for unrelated reasons, the owner of the chlor-alkali plant decided to cease operation and the hypochlorite plant was never built.

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