Quality Control of Purchased Lime and Limestone

Kevin Taylor, B.Sc., M.Sc. (Chemistry), PChem
Taylor Industrial Research, Inc.
Tel: 250-418-5705 Fax: 250-361-0099
Email: kevin.taylor@industrialresearch.ca Website: www.industrialresearch.ca

BACKGROUND

At a number of Kraft mills, variation in the quality of purchased lime or limestone has resulted in serious process disruptions and shutdowns. Problems include causticizing upsets, increased plugging of white liquor pressure filters, decrease in lime mud solids content, and increased lime kiln ring formation. Previous work has shown that increased levels of iron, clays and magnesium in purchased lime and limestone have resulted in process disruption. At one mill, high manganese concentrations in purchased lime appeared to lead to pressure filter plugging. Lime purity requirements for Kraft mills are much higher than required for other lime end uses. This is because non-process element impurities accumulate in the lime cycle of a Kraft mill.

STRATEGY

An extensive sampling and analysis program was carried out with purchased lime delivered to two BC Kraft mills from the Exshaw, Alberta and the Pavilion, BC limestone quarries. These two quarries produce chemical quality lime and are operated by Graymont Inc. As part of this work, sampling and analysis was carried out on the limestone and quarry impurities at both mine sites. Statistical evaluation of the composition and physical properties of produced lime from both sites was carried out. Additional quarries were evaluated in Eastern Canada. In each case, the factors that affect lime quality were determined from the time that the limestone was mined at the quarry until finished lime was delivered to the mill site.

RESULTS

In this work, it was shown how both the chemical and physical properties of purchased lime can be responsible for mill process upsets. This work clearly outlined areas to improve delivered lime quality at Kraft mills.