such as a particular crystal size. Further, the maximum product yield is often reached long before the reaction period is terminated, thereby unnecessarily consuming time and resources, and sometimes yielding unwanted by-product phases. Batch-to-batch process variations may also yield inconsistent physical properties between batches. In the absence of a reliable method for determining the endpoint of the synthesis, the reaction mixture may be heated for an unnecessarily prolonged period of time with the concomitant production of undesirably large crystals. It would be desirable to have a method for monitoring the progress of the crystallization, for batch and continuous molecular sieve synthesis processes that could provide information on crystallization more rapidly than conventional powder XRD analysis.

[007] It would also be desirable to monitor the progress of molecular sieve crystallization such that the endpoint of the synthesis reaction could be predicted in advance of the actual endpoint. The early determination of the reaction endpoint would allow the synthesis process to be stopped at a time when the molecular sieve crystals are at their most desirable, for example, with respect to crystal size.

[008] Therefore, there is a need for methods for monitoring crystallization during molecular sieve synthesis that allow the early detection of the endpoint of the reaction, thereby enabling the consistent and reliable production of molecular sieves having desirable characteristics, in the minimum amount of time and with maximum energy efficiency.

SUMMARY OF THE DISCLOSURE~~INVENTION~~

[009] In one aspect, the disclosure~~invention~~ is directed to a method for synthesizing a molecular sieve comprising: providing a reaction mixture sufficient to synthesize the molecular sieve; maintaining the reaction mixture under crystallization conditions; monitoring at least one viscometric parameter of the reaction mixture; and determining an endpoint based on the monitoring of the at least one viscometric parameter.

[009a] In another aspect, there is provided a method for synthesizing a molecular sieve comprising at least one tetravalent framework element and at least one trivalent or pentavalent element, comprising: a) providing a reaction mixture sufficient to synthesize the molecular sieve; b) maintaining the reaction mixture under crystallization conditions; c) monitoring at least one viscometric parameter of the reaction mixture, wherein the monitoring step comprises: (1) periodically removing a sample of the reaction mixture; cooling each sample to a pre-defined temperature; and measuring the at least one viscometric parameter of each sample; or (2) periodically removing a sample of the reaction mixture; subjecting each sample to a plurality of shear rates; recording a shear stress corresponding to each of the plurality of shear rates to provide a plurality of shear stress values; and determining a viscosity shear rate index for each sample; and d) determining an endpoint based on the monitoring of the at least one viscometric parameter.

[010] In another aspect, the disclosure~~invention~~ is directed to a method for monitoring crystallization of a molecular sieve from a reaction mixture during a molecular sieve synthesis process, the method comprising: monitoring at least one viscometric parameter of the reaction mixture; and determining an endpoint of the molecular sieve synthesis process.