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(54) Title: METHODS AND SYSTEMS FOR FORMING VATERITE FROM CALCINED LIMESTONE USING ELECTRIC KILN

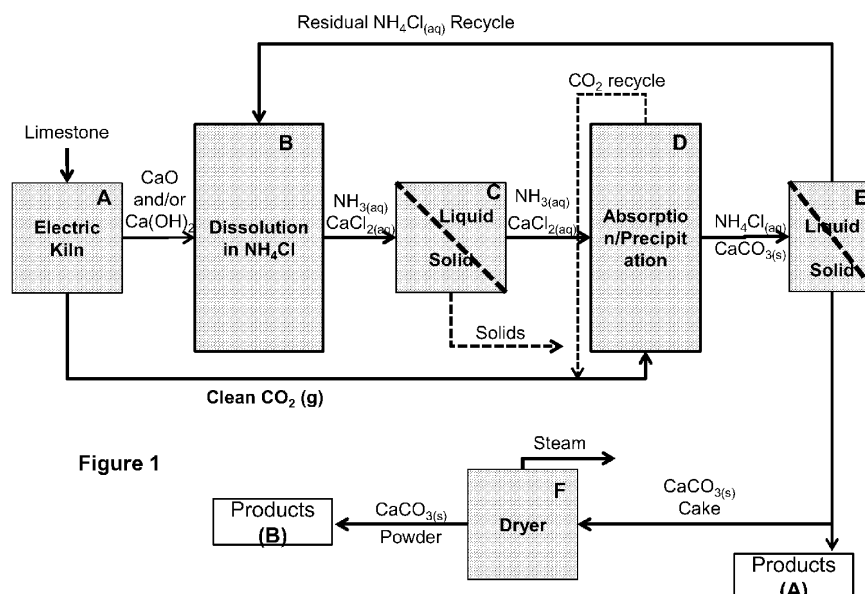


Figure 1

(57) Abstract: Provided herein are zero carbon dioxide (CO₂) emission processes and systems to carry out the processes, comprising a) calcining limestone in a cement plant in an electric kiln to form a mixture comprising calcium oxide and a first gaseous stream comprising clean carbon dioxide, wherein the clean carbon dioxide comprises no gaseous or non-gaseous components from combustion of fuel; b) treating the mixture comprising calcium oxide with a N-containing salt solution under one or more dissolution conditions to produce a first aqueous solution comprising calcium salt; and c) contacting the first aqueous solution with the first gaseous stream comprising clean carbon dioxide under one or more precipitation conditions to produce a precipitation material comprising vaterite, aragonite, calcite, or combinations thereof.

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