

ABSTRACT

DEVICE AND METHOD FOR STAGED ABSORPTION AMMONIA-BASED DECARBONIZATION

Staged absorption ammonia-based decarbonization using an absorption circulating liquid containing ammonium salts to remove carbon dioxide in a gas, and control ammonia escape while realizing efficient decarbonization through staged solution composition control and reaction condition control. Staged solution composition control may include concentration gradient control of ammonium carbonate, ammonium bicarbonate, ammonium carbamate, ammonia, or combinations thereof, which may be characterized by the molar ratio of total ammonia to total CO₂. Reaction condition control may include temperature control, pH control, and pressure control. The flue gas may enter the decarbonization tower, and through staged absorption, establishment of concentration, temperature, and multi-point addition of ammonia, decarbonization efficiency may be improved, decarbonization operating costs may be saved, and ammonia escape may be controlled.

[Figure 1]