

**USE OF CHEMICAL REACTION TO SEPARATE ETHYLENE FROM ETHANE
IN ETHANE-BASED PROCESSES TO PRODUCE ACETIC ACID**

ABSTRACT

Described herein is a process in which acetic acid is produced by ethane oxidation. One byproduct of the ethane oxidation is ethylene. High ethylene content in the recycle gas stream will lead to poor efficiencies and higher losses to the CO_x byproduct in the acetic acid reactor. In fact, ethylene in the recycle feed competes with the ethane for the limited amount of oxygen feed, resulting in higher inefficiencies to carbon oxides than straight ethane oxidation. Ethylene is removed in this process by a further oxidation reaction at a temperature low enough such that ethane is not reactive, but the ethylene is converted to acetic acid. Either the ethane oxidation reactor effluent or a portion or all of the recycle stream to the ethane oxidation reactor, or any combination of the same, can be processed in this manner to reduce the ethylene content of those streams.

Figure 2