[00118] CLAIMS

WHAT IS CLAIMED IS:

1. A method for starting-up an alkylene oxide production process, the alkylene oxide production process comprising reacting a feed gas comprising an alkylene, oxygen, and at least one organic chloride over a high efficiency silver catalyst to yield a reaction product comprising the alkylene oxide, the start-up method comprising:

providing a feed gas comprising the alkylene, oxygen, and the at least one organic chloride, wherein the feed gas has an overall chloriding effectiveness represented by the formula:

$$Z^* = \frac{\text{ethyl chloride equivalent (ppmv)}}{\text{ethane equivalent (mole \%)}}$$

wherein the ethyl chloride equivalent is the total concentration in ppmv of ethyl chloride which provides ~~substantially~~ the same catalyst chloriding effectiveness of the at least one organic chloride in the feed gas at the concentration of the at least one organic chloride in the feed gas, the ethane equivalent is the total concentration in mole % of ethane which provides ~~substantially~~ the same dechloriding effectiveness as the non-chloride containing hydrocarbons in the feed gas at the concentration of the non-chloride containing hydrocarbons in the feed gas, and the feed gas has a Z* value ranging from 1.0 to 5.0;

reacting the feed gas over the high-efficiency silver catalyst at a reaction temperature such that within a catalyst aging period of no greater than 0.03 kT alkylene oxide/m^3 catalyst after the reactor is first on-stream, the reaction temperature is from 215°C to 240°C, and the molar ratio of oxygen to the alkylene in the feed gas is at least 0.2, thereby yielding a reaction product comprising a start up concentration of the alkylene oxide.

2. The method of claim 1, further comprising selecting a target alkylene oxide concentration in the reaction product and maintaining the molar ratio of oxygen to alkylene of at least 0.2 no longer than until the start-up concentration of the alkylene oxide in the reaction product is ~~substantially~~ equal to the target concentration of the alkylene oxide in the reaction product.

to the alkylene oxide, the first efficiency to the alkylene oxide being less than a ~~desired~~ target efficiency to the alkylene oxide;

adjusting at least one process parameter such that the efficiency of the process to the alkylene oxide increases from the first efficiency to a second efficiency, wherein the at least one process parameter is selected from the group consisting of the molar ratio of oxygen to the alkylene in the feed gas, reactor temperature, and overall chloriding effectiveness, following the adjusting step the molar ratio of oxygen to the alkylene in the feed gas is at least 0.2, the reaction temperature is from 215°C to 240°C, the overall chloriding effectiveness is represented as Z* and is from 1.0 to 5.0, and Z* is represented as follows:

$$Z^* = \frac{\text{ethyl chloride equivalent (ppmv)}}{\text{ethane equivalent (mole \%)}}$$

wherein the ethyl chloride equivalent is the total concentration in ppmv of ethyl chloride which provides ~~substantially~~ the same catalyst chloriding effectiveness of the at least one organic chloride in the feed gas at the concentration of the at least one organic chloride in the feed gas, and the ethane equivalent is the total concentration in mole % of ethane which provides ~~substantially~~ the same dechloriding effectiveness as the non-chloride containing hydrocarbons in the feed gas at the concentration of the non-chloride containing hydrocarbons in the feed gas.

10. The method of claim 9, wherein the at least one process parameter includes reaction temperature, and the step of adjusting the reaction temperature comprises adjusting the reaction temperature from a value outside the range of 225°C to 235°C to a value inside the range of 225°C to 235°C.

11. The method of claim 9, wherein the at least one process parameter includes the molar ratio of oxygen to alkylene in the feed gas, and the step of adjusting the molar ratio of oxygen to alkylene in the feed gas comprises adjusting the molar ratio from a first value of less than 0.2 to a second value of at least 0.2.

12. The method of claim 9, wherein the second efficiency to the alkylene oxide is at least 85%.

13. The method of claim 9, wherein following the adjusting step the molar ratio of oxygen to the alkylene in the feed gas is no more than 0.35.