CLAIMS

WHAT IS CLAIMED IS:

1. A method of maintaining a desired value of an alkylene oxide production parameter in a process for making the alkylene oxide by reacting a feed gas comprising an alkylene, oxygen, and at least one organic chloride over a high-efficiency silver catalyst, the method comprising the steps of:

selecting a target value of alkylene concentration in the feed gas and a target value of oxygen concentration in the feed gas, wherein the target value of the alkylene concentration in the feed gas, the target value of the oxygen concentration in the feed gas, and the desired alkylene oxide production parameter correspond to a first reaction temperature; and

maintaining at least one selected from the group consisting of the alkylene concentration in the feed gas and the oxygen concentration in the feed gas below its corresponding target value to maintain the desired value of the alkylene oxide production parameter at a second reaction temperature greater than the first reaction temperature.

2. The method of claim 1, wherein the second reaction temperature corresponds to a minimum achievable reactor coolant temperature.

3. The method of claim 1, wherein the step of maintaining at least one selected from the group consisting of the alkylene concentration in the feed gas and the oxygen concentration in the feed gas below its corresponding target value further comprises maintaining an overall catalyst chloriding effectiveness at a substantially constant value.

~~4. The method of claim 1, wherein the step of maintaining at least one selected from the group consisting of the alkylene concentration in the feed gas and the oxygen concentration in the feed gas below its corresponding target value is carried out for a period of no more than one year.~~

~~5.~~4. The method of claim 1, further comprising reducing the concentration of oxygen in the feed gas to a value above a selected minimum concentration of oxygen in the feed gas if the alkylene oxide production parameter is greater than the desired value of the

alkylene oxide production parameter, the second reaction temperature is equal to a minimum achievable reaction temperature, and the concentration of oxygen in the feed gas is greater than the selected minimum oxygen concentration in the feed gas.

~~6.~~5. The method of claim 1 further comprising reducing the concentration of alkylene in the feed gas to a value above a selected minimum concentration of alkylene in the feed gas if the alkylene oxide production parameter is greater than the desired value of the alkylene oxide production parameter, the second reaction temperature is equal to a minimum achievable reaction temperature, and the concentration of alkylene oxygen in the feed gas is greater than the selected minimum alkylene concentration in the feed gas.

~~7.~~6. The method of claim 1, further comprising:

selecting a target value of carbon dioxide concentration in the feed gas;

maintaining the concentration of carbon dioxide in the feed gas at a value greater than the target value to maintain the desired value of the alkylene oxide production parameter.

~~8.~~7. The method of claim ~~7~~6, further comprising determining whether the oxygen concentration in the feed gas is greater than a selected minimum concentration of oxygen in the feed gas, determining whether the alkylene concentration in the feed gas is greater than a selected minimum concentration of the alkylene in the feed gas, and wherein the step of maintaining the concentration of carbon dioxide in the feed gas at a value greater than the target value is performed only if the concentration of oxygen in the feed gas is not greater than the selected minimum concentration of oxygen in the feed gas and the concentration of alkylene in the feed gas is not greater than the selected minimum concentration of alkylene in the feed gas.

~~9.~~8. The method of claim ~~7~~6, wherein the step of maintaining the concentration of carbon dioxide in the feed gas at a value greater than the target value of carbon dioxide concentration in the feed gas comprises maintaining the concentration of carbon dioxide in the feed gas below a maximum value of not more than five (5) mole percent.

~~10. The method of claim 1, wherein the step of maintaining at least one selected from the group consisting of the alkylene concentration in the feed gas and the oxygen~~

~~concentration in the feed gas below its corresponding target value comprises maintaining the alkylene concentration in the feed gas at no less than eighteen (18) mole percent.~~

~~11. The method of claim 1, wherein the step of maintaining at least one selected from the group consisting of the alkylene concentration in the feed gas and the oxygen concentration in the feed gas below its corresponding target value comprises maintaining the oxygen concentration in the feed gas at no less than its corresponding target value and no less than four (4) mole percent.~~

~~12. The method of claim 1, wherein the first reaction temperature is selected to achieve a maximum efficiency toward the production of the alkylene oxide at a selected value of an overall catalyst chloriding value, the target alkylene oxide production parameter, the target concentration of oxygen in the feed gas, the target concentration of alkylene in the feed gas, and the target concentration of carbon dioxide in the feed gas.~~

~~13. The method of claim 1, wherein the first reaction temperature corresponds to an optimized combination of reaction temperature and overall catalyst chloriding effectiveness at the target concentration of oxygen in the feed gas, the target concentration of alkylene in the feed gas, and the target concentration of carbon dioxide in the feed gas, and the optimized combination of reaction temperature and overall catalyst chloriding effectiveness is determined by determining the efficiency toward the production of the alkylene oxide at a variety of values of the alkylene oxide production parameter as the overall catalyst chloriding effectiveness is varied over a specified range at a plurality of reaction temperatures.~~

~~14.~~9. A method of maintaining a desired value of an alkylene oxide production parameter in a process for making the alkylene oxide by reacting a feed gas comprising an alkylene, oxygen, and at least one organic chloride over a high-efficiency silver catalyst, the method comprising the steps of:

selecting a target value of alkylene concentration in the feed gas, a target value of oxygen concentration in the feed gas, and a target value of carbon dioxide concentration in the feed gas, wherein the target value of the alkylene concentration in the feed gas, the target value of the oxygen concentration in the feed gas, the target value of carbon dioxide concentration in the feed gas, and the desired alkylene oxide production parameter correspond to a first reaction temperature; and

maintaining the carbon dioxide concentration in the feed gas above its corresponding target value while maintaining the alkylene concentration in the feed gas and the oxygen concentration in the feed gas at or above their corresponding target values to maintain the desired value of the alkylene oxide production parameter at a second reaction temperature greater than the first reaction temperature.

~~15.~~10. —The method of claim ~~14~~9, wherein the second reaction temperature corresponds to a minimum achievable reactor coolant temperature.