

Ethanolamines/Glycol Ethers In Plant Training (IPT)

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Glycol Ethers Reactor System Including Oxide And Alcohol R-101, R-102, and R-103

Answers:

1. **State the importance of maintaining a constant catalyst flow to R-101.**
A constant catalyst flow to the reactor is important in preventing any unreacted oxide from leaving R-103 and entering E-102.
2. **State what an increasing temperature across R-103 would indicate.**
Indicates a slower reaction rate in R-101/102.
3. **State what can be done to lower the delta t across R-103.**
 - A. Increase catalyst flow to MX-101.
 - B. Increase R-101/102 shell pressures.
4. **State what effect recycle flows have on product mix.**
We recycle PM to react with oxide to make more DPM, DPM to make more TPM and so on.
5. **State the methods of controlling temperature on the reactor system.**
With R-101/102 shell pressure and catalyst feed.
6. **State how the pressure is controlled on the tube side of the reactors.**
With FIC-1024 (P-104 A/B recirculation control valve).
7. **Explain how the salt is formed on the Dowfroth series run and how it is controll d.**
 - A. The salt is formed when catalyst is neutralized.
 - B. By minimizing the amount of catalyst used and the use of TPM recycle.
8. **State the purpose of the makeup steam on R-101/102.**
To maintain shell pressure and temperature.
9. **Explain why the temperature controller and HIC-1063 are needed in the reactor system.**
The temperature controller is used to heat the alcohol feed to R-101 by cross exchanging reactor effluent with the feed. The HIC valve bypasses the alcohol to E-102 and flows cool alcohol to R-101.

10. **Explain the process of pressuring up the reactor system for startup.**
Bleed air from P-104 and E-104 and establish a recirculation flow with total flow through E-104 (FIC-1024 about 1/2 open. With EBV-1064 in manual in the field, start a flow to R-101 through R-102, 103 and E-102 up to the alcohol control valve FIC-1046 regulating the flow with the manual block valve just under EBV-1064. Establish a flow with the manual block valve and wait for pressure to build up. As pressure approaches operating condition take a small flow to T-110 to bleed inerts from the system for about 5 minutes.
11. **State the minimum and maximum flows for the P-101's and P-104's.**
A. P-101 A/B: minimum 10,890 pounds per hour.
B. P-101 A/B: maximum 37,901 pounds per hour.
C. P-104 A/B: minimum 37,462 pounds per hour.
D. P-104 A/B: maximum 91,080 pounds per hour.
12. **State what steps could be taken to increase the reaction rate in R-101 and R-102.**
Increase the shell pressure or catalyst flow.
13. **State the minimum level DV-103/104 should run.**
No less than 60%.
14. **State where R-101/102 steam is used on the EB series. High PM. Dowfroth.**
A. EB = D-510
B. PM = E-110
C. Dowfroth = E-110
15. **State the pressure safety valve setting for R-101/102 shells.**
500 psig.
16. **State the pressure safety valve setting for R-101/102 tube side at R-101, 102, 103 and E-102.**
All are set at 750 psig.
17. **Demonstrate how to place oxide and alcohol on VAX control.**
18. **State the purpose for the high and low limit controllers for oxide and alcohol to R-101.**
To prevent a flow drive up-scale on oxide and down-scale on alcohol pass the desired rate. Limit controllers should be set 5% above for oxide and 5% below for alcohol of the desired rate.

Revisions:

Revision No. 1	06-18-93	Yearly Review
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Revision No. 2 12-18-94 Yearly Review

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