

Spring 2020

THE OZONE HOLES

1. HISTORY

Give a brief history (timeline) relating the discovery of the ozone hole to the chemists who drove the policy decisions related to the phase out of ozone depleting compounds.

A. Rowland and Molina

- i. Discuss the contribution these scientists made in regard to ozone chemistry.

B. Susan Solomon

- i. Discuss her contribution to our understanding of the chemistry of the ozone hole phenomena.

C. Dobson

D. Montreal Protocol

2. CHEMISTRY OF OZONE DEPLETION

A. Reactions that create the ozone hole

i. What is Mechanism II?

1. *Why is it the dominant reaction pathway in the ozone hole event?*

B. Activation of catalytically inactive chlorine

i. What are the two main forms of inactive chlorine? These would be considered the terminating step under normal stratospheric conditions.

E. What are the consequences of decreased ozone levels?

3. CHEMICALS THAT CAUSE OZONE DESTRUCTION

A. What are some of the X catalysts found naturally in the atmosphere and what are their sources?

B. CFC's

i. What are they?

ii. How do you convert from the industry name to the chemical name?

1. *Example - CFC-12 is CF_2Cl_2*

C. HCFC's

- i. HCFC-22

D. HFC's

- i. HFC-134a

E. Halons

- i. H-1301