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OZONE LAYER PROBLEMS

Prof. Dr. Nader Mohammad Siam

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A B S T R A C T

During the photochemical processes of its formation and dissociation in the Stratosphere, the Ozone molecules (O_3) absorb the harmful Ultra Violet sun's rays (UV), which its spectrum waves length range between 200 and 320 nanometer, Thus the Stratospheric Ozone layer protects the creature of the Earth from the danger of this ray.

Nowadays, it is believed that Ozone layer is depleted and a hole appears in it yearly through the Spring season over the Antarctic continent. Many studies ascribe this hole to the photochemical reactions happening in the stratosphere, in which Freon compounds take part. These compounds are also known as the Chlorofluorocarbons (CFCs) or Chlorofluoromethanes (CFMs) or Halo - Carbon compounds. The most important of them are : $CFCl_3$ (CFC-11), CF_2Cl_2 (CFC-12); in addition to : $C_2F_3Cl_3$ (CFC-113); $C_2F_4Cl_2$ (CFC-114); C_2F_5Cl (CFC-115); CCl_4 ; CH_3Cl ; $C_2H_3Cl_3$ or CH_3CCl_3 . These compounds dissociate photochemically when absorbing the UV ray in the Stratosphere producing $\dot{C}l$ and $\dot{C}lO$ radicals, which, also photochemically react with Ozone molecules (O_3) and with the free excited atoms of oxygen (\dot{O}) and thus, destroy the Ozone layer.

Moreover, the depletion of Ozone layer is also attributed to the photochemical reactions between the N_2O ; NO and NO_2 with O_3 molecules and \dot{O} atoms. And also between O_3 and \dot{O} with the Bromine free atoms (\dot{Br}), which are produced from the photochemical dissociation of CH_3Br ; $C_2F_2BrCl_3$ (Halon-1211); CF_3Br (Halon-1301); $C_2F_4Br_2$ (Halon-2402) and CH_2Br , CH_2Br in the Stratosphere.

Nevertheless, it is believed that the photochemical reactions are not sufficient alone to deplete the Ozone layer and create the Ozone Hole through it. Many studies assured that the $\dot{C}l$ and $\dot{C}lO$ radicals enter a series of marginal photochemical reaction with NO ; NO_2 ; CH_4 and CH_3Cl producing compound, such as $ClONO_2$ and HCl , can not react with O_3 or \dot{O} . Thus they remove each other from the photochemical

reactions circle with O_3 .

Recently, it was suggested that the depletion of the Ozone layer and the creation of the spring ozone hole over the Antarctic continent belongs to the atmospheric circulation centered over the south pole, known as Antarctic Vortex, which disperse the ozone out of the Antarctic Stratosphere and prevent it from entering it too.