

CHANGES IN AIR POLLUTION AND ATMOSPHERIC CORROSIVITY IN THE CZECH REPUBLIC-EFFECT ON MATERIALS DEGRADATION

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Airborne acidifying pollutants are known to be one major cause of corrosion of different materials. The most sensitive materials are metals used as structural material of infrastructure and architecture (bridges, roofs, facades, pipeline, etc.) and/or materials of a lot of equipment (computers, electronic and electric instruments, automotive, etc.). The effects of air pollution onto materials degradation are studied since the beginning of last century. The first studies focus on architecture, civil engineering—corrosion and tarnishing of the metals (brass, zinc) used in building [1]. SVUOM specialists were very active in investigation of atmospheric corrosivity since 1950 [2]. World studies performed in period 1930-1990 showed dependence of „unit“ corrosion rate of metal at open atmosphere on SO₂ pollution as the most dominant factor of anthropologic pollution (80%). For this situation a lot of risk management studies had been performed based on dose-response functions allowed to estimate the cost of atmospheric corrosion, resp. air pollution [3]. In Europe the SO₂ pollution significantly decreased since 1990 for ca 70% minimum. It resulted into decreasing of metal corrosion rate, increasing of their durability and service life, reducing metal run-off into surrounding environments, etc.. The atmospheric corrosion is now affected by other factors. After the reduction of SO₂ air pollution the particle matter pollution remains significant in many European regions. Very aggressive dust particles are chlorides even in non-marine regions where the chloride source are de-icing salts. They negative effect not only water (rivers, lakes) and vegetation, but also the exposed materials. The last studies are focus also onto the assessment of the potential impacts of climate change on the atmospheric corrosion. Annual mean temperatures increased during the 1930s, cooled during the 1940s, remained relatively constant until 1975, increased rapidly until 1998 with a net temperature increase of ~0.8 C, and have remained relatively constant until 2011. Besides global warming, there are also changes in other parameters. For example, average annual precipitation increased by nearly 10% over the course of the 20th century.