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Homework 1

**Question: What is the “mission” of NACE?  What is the “mission” of TMS?  Browse their websites to find the answer.**

According to the mission statement of TMS, the mission of TMS is to “promote the global science and engineering professions concerned with minerals, metals, and materials”.

The mission of NACE, according to their website, is to “equip society to protect people, assets and the environment from the adverse effects of corrosion.”

**I-9. A carbon steel test specimen of dimensions 2-in. x 3-in. x 0.125-in. with a 0.25-in. hole for suspending in solution is exposed for 120 hours in an acid solution and loses 150 milligrams. Calculate the corrosion rate in mpy and mm/yr.**

Conversion to SI units (except for time, which is converted to years):

Table 1. Calculation parameters

|  |  |
| --- | --- |
| Carbon steel density: |  |
| Test specimen volume: |  |
| Mass loss: |  |
| Area (disregarding surface area of hole, since complete hole dimensions are not given) |  |
| time |  |

Equation for corrosion rate:

|  |  |
| --- | --- |
| where  is the corroded thickness  is the corroded mass  is the elapsed time  is the area of the specimen  is the density of the specimen  Calculation of corroded thickness over time using equation 1 and values from table 1: | (1) |

**Answer:**