

KE-42.6500 Unit Operations of Environmental Technology

Instruction: Duration of exam 3 hours. Only pocket calculator is allowed to use.

EXAM 12.5.2010

1. Supercritical conditions of CO₂ and H₂O. Their practical application in environmental technology
2. What is LCA? Describe the main stages and procedures of LCA
3. Ozone in removal of Fe and Mn from drinking water
4. Wet oxidation (WO) with air and oxygen.
5. At the stages of raw materials extraction, production of product and its disposal are emitted N₂O and CFC-12 in the following amounts causing global warming:

Raw materials extraction (5 t/f.u.): CFC-12 = 0.5 kg/t; N₂O = 0.2 kg/t

Production of a product (1.0 t/f.u.): CFC-12 = 0.4 kg/t; N₂O = 0.1 kg/t

Disposal of a product (0.2 t/f.u.): CFC-12 = 0.2 kg/t; N₂O = 0.05 kg/t

Calculate the global warming potential (equiv. to CO₂)

of the technological flowsheet taking the classification factor for CFC-12 8000 kg/kg and for N₂O 100 kg/kg

6. How much is the need of ozone to destroy totally heptane (100 mg/L) in 1000 m³ of wastewater? Calculate COD of this water.