**April 29, 2016**

**KMÜ 392/21-22** **Chemical Process Industries**

**HOMEWORK**

(Due June 3, 2016)

**1.** The Cement Sustainability Initiative (CSI) is a global effort by 25 major cement producers with operations in more than 100 countries who believe there is a strong business case for the pursuit of sustainable development. [Battelle Memorial Institute](http://www.battelle.org/)’s report, [*Toward a Sustainable Cement Industry*](http://www.wbcsd.org/pages/edocument/edocumentdetails.aspx?id=148&nosearchcontextkey=true), was released in April 2002. The report listed several major topics that will shape the cement industry's path toward a more sustainable future in the next 20 years. Some of them:

* Resource productivity: improving eco-efficiency through improved practices in quarrying, energy use and waste recovery and reuse;
* Climate protection: understanding and managing CO2 emissions;

Discuss the importance of these topics for the sustainable development in cement industry.

**2.** Sustainable production is becoming an increasingly important issue in the process industries. In the cane sugar industry, pressure for sustainable production has come largely from the importers of ethanol from sugarcane. This has focused attention on sustainable production in the sugar industry in general. Some of the major producers of white sugar are aware of the advantages in the market place of sustainable manufacturing processes in terms of brand enhancement and are using the low carbon footprint of sugar to their advantage. Discuss the carbon footprint of raw and refined sugar.

**3.** You are expected to prepare a short report on the subject of “Water Conditioning (uses of water, required water properties, details of water conditioning processes, etc.) and Waste Water Treatment (the composition and quantity of waste water of that industry, treatment processes, environmental conditions, etc.)” for the pharmaceutical industry.

**4.** You are expected to prepare a short report on the subject of “Environmental effects associated with the geothermal energy”.

**5.** You are expected to prepare a short report on the subject of “Energy Input (uses of energy, required fuel properties, details of fuel pretreatment processes, etc.) and Air Pollution (Solid, liquid and gaseous pollutants)” for the iron and steel industry.