

Children learn more
from what you are
than what you teach
assignment



**ASSIGN
BUSTER**

Material and Energy Balance and Simulation (CHEESE) Combustion and Environment 1 . This activity contributes 5% of the course work (Group Assignment). 2. Form a group of 4 to 5 person. 3. Dateline: 1 September 2014, pm Learning outcome 1 . Apply the calculation for fundamentals of material balance for reactive system. 2. Calculate the parameter required for the combustion process. Scenario You have been assigned by the Department of Environment (DOE) to measure SO₂ emission from a small industrial power plant.

You have withdrawn and analyzed a gas sample from the boiler stack and obtain the following composition: 75.66% NO, 10.24% CO, 8.27% H₂O, 5.75% O₂ and 0.0825% SO₂. On the next day, you show these figures to the plant superintendent and he insists that the analysis must be incorrect, since the fuel was a natural gas containing methane and ethane and no sulfur. Then, you ask the superintendent if they ever burn another fuel and he replies that they sometimes use a fuel oil. However, the plant log shows that they were wrong no doing so when the measurement were made. 1 .

Draw and label a Lockhart of this process. 2. Perform a degree of freedom analysis and state any assumptions you made. 3. Calculate the mole ratio of carbon to hydrogen in the fuel and use the result to prove that the fuel could not have been the natural gas. 4. Suppose the combustion products are released directly into the environment. Determine whether it comply Malaysian Ambient Air Quality Standard (AMASS). State any assumptions you made. (10 MARKS) A. Technical Report Draft a technical report addressed to the Process Engineer on your team's evaluation of the power plant.

Your report can take the following format and should not be more than 10 pages. Use Font: Times New Roman, Size: 12, Spacing: 1.15, Alignment: Justified Report Format: Report cover page: Date: Team members: Subject: Contents: 1. Introduction 2. Objective of the evaluation 3. Key findings Summary Conclusion and recommendations Assessment The distribution of marks for the various activity components is contained in Table 1 . Please attach this form on the last page of your report.