**Task 10 – Industrial Processes Research Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Task:** You will be provided with time in class and at home to write a report that addresses the points below. In your report you should ensure that you include correct scientific information and language. Other Scientific conventions like labelling diagrams should also be included. This report must be submitted electronically to your teacher on the day of the validation.

* List the equations for the chemical reactions involved in both the Haber and Contact process
* For each process describe and explain the temperature and pressure conditions used, ensure your response includes references to collision theory and chemical equilibrium
* Draw/create a diagram/flowchart of the process that identifies each step and the required conditions
* Describe any environmental considerations for either of the processes

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| **Descriptor** | **0 marks** | **1 mark** | **2 marks** | **3 marks** | **4 marks** |
| Chemical Reactions | Some (<50%) necessary chemical reactions included in report. |  | Most (>50%) necessary chemical reactions included in report. | All necessary chemical reactions included in report. | All necessary chemical reactions included in report. Provided in the correct order. |
| Temperature and pressure conditions | Incomplete or incorrect temperature and pressure conditions listed/no explanation attempted. |  | Temperature and pressure conditions listed, some attempt at explaining these conditions using relevant theories. |  | Temperature and pressure conditions listed, detailed attempt at explaining these conditions using relevant theories. |
| Labelled diagrams/flow charts | Labelled diagrams missing or not drawn/created by the student. | Drawn/created diagram of both processes. Some labels missing/incorrect. |  |  | Drawn/created diagram of each process. Equipment and conditions labelled correctly. |
| Environmental Considerations | No environmental considerations provided. | Environmental consideration provided for one process. | Environmental consideration provided for bother processes |  |  |

Resources for research could include:

* Your textbook
* <https://chem.libretexts.org/Bookshelves/Physical_and_Theoretical_Chemistry_Textbook_Maps/Supplemental_Modules_(Physical_and_Theoretical_Chemistry)/Equilibria/Le_Chateliers_Principle/The_Haber_Process>
* <https://chem.libretexts.org/Bookshelves/Physical_and_Theoretical_Chemistry_Textbook_Maps/Supplemental_Modules_(Physical_and_Theoretical_Chemistry)/Equilibria/Le_Chateliers_Principle/The_Contact_Process#:~:text=The%20Contact%20Process%20is%20used,the%20economics%20of%20the%20process>.

In addition to completing this report/research, you should aim to complete the document titled ‘Task 10 Supporting Examination Questions’