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PC-06

Principle of Green Technology

Assignment - 1

(a) Explain Atom Economy.

One of the fundamental and most important principles of green chemistry is that of atom economy. This essentially is a measure of how many atom of reactants end up in the final product and how many end up in by products or waste. The percentage atom economy can be calculated as 100 times the relative molecular mass (RMM) of all atoms used to make wanted product & divided by the RMM of all reactants. The real benefits of atom economy is that it can be calculated at the reaction planning stage from a balanced reaction equation.

% Atom Economy = 100 * (RMM of desired products / RMM of all reactants)

(or) Write in brief about Integrated Pollution Prevention and Control (IPPC).

Integrated Pollution Prevention & Control (IPPC), to minimize pollution from various industrial sources through the European Union as established by the so-called IPPC Directive (Directive 2008 of 15 January, 2008. Integrated Pollution Prevention and Control). The relegation requires industrial and agricultural activities with a high pollution potential to have a permit. This permit can only be issued if certain environmental conditions are met, so that the companies themselves bear responsibility for preventing and reducing any pollution they may cause. All permit application must be sent to the competent authority of the state concerned, which will then decide whether or not

to authorize the activity. The IPPC Directive is based on several principles, namely an integrated approach, best available techniques, flexibility and public participation.

(8) Mention in brief about the concept and methodology of inherently safer design.

Inherently safer design (ISD) is a philosophy for addressing safety issues in the design and operation of facilities that use or process hazardous chemicals when considering ISD, the designer tries to manage process risk by eliminating of significantly reducing hazards.

Often the traditional approach to managing chemical process safety has accepted the existence and magnitude of hazards in a process and incorporated engineering and administrative controls to reduce process risk where feasible, ISD provides more robust and reliable risk management, and has the potential to make the chemical processing technology simpler and more economical by eliminating the need for expensive safety systems and procedures. ISD addresses the immediate impact of single events (chemical reactions) on people, the environment property and business. In many cases, an ISD also will be beneficial for other types of process risk, chronic health risk, or risk to consumers or product users.

(04) Mention in brief about how non-conventional energy resources are important in promotion of green technology.

Non-conventional/Renewable energy is a indegeneous source available in considerable quantities to all developing nations and capable, in principle of having a significant local, regional or national economic impact.

→ The power plants based on renewable resources do not have any fuel cost and hence, negligible running cost.

→ They have low energy density and more or less there is no pollution or ecological imbalance problem.

→ The use of non-conventional energy could help to conserve foreign exchange and generate local employment if conservation technology are designed, manufactured, assembled and installed locally.