

# Auxiliary Concept: Chemical Applications

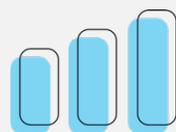
**Engineering Literacy Dimension:** Engineering Knowledge

**Domain:** Engineering Technical Applications

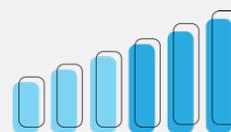
**Overview:** *Chemical Applications* are the activities and knowledge related to converting materials into more usable substances as well as selecting the best materials for specific applications. This concept is important to Engineering Literacy as engineering professionals apply their understanding of chemistry, and the properties of the materials, to solve a variety of problems.

## Performance Goal for High School Learners

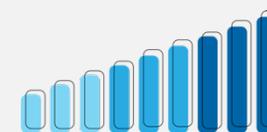
I can, when appropriate, draw upon the knowledge of Chemical Applications content, such as (a) *inorganic chemistry*, (b) *organic chemistry*, (c) *chemical, electrical, mechanical, and physical properties*, (d) *material types and compatibilities*, (e) *corrosion*, and (f) *membrane science*, to analyze and select, or propose a novel combination of, materials to produce a desired product or process.



Basic



Proficient



Advanced

### APPLICATIONS OF INORGANIC CHEMISTRY

I can define inorganic chemistry, differentiating it from organic chemistry.

I can identify inorganic compounds while illustrating their basic characteristics.

I can evaluate the practical applications of inorganic chemistry to optimally solve design problems.

### APPLICATIONS OF ORGANIC CHEMISTRY (e.g. Biofuels)

I can define organic chemistry, differentiating it from inorganic chemistry.

I can identify organic compounds while illustrating their basic characteristics.

I can evaluate the practical applications of organic chemistry to optimally solve design problems.

### CHEMICAL, ELECTRICAL, MECHANICAL, & PHYSICAL PROPERTIES

I can describe how chemical substances can be characterized and categorized.

I can illustrate the relationships between chemical, electrical, mechanical, and physical properties of chemical substances.

I can justify the selection of chemical substances for specific engineering applications based on their properties.

### MATERIAL TYPES & COMPATIBILITIES

I can describe chemical compatibility with specific material examples.

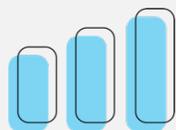
I can illustrate the chemical compatibilities and safety combinations between different substances with a chemical compatibility chart.

I can evaluate which material type is most appropriate to a given design problem based on its chemical compatibilities.

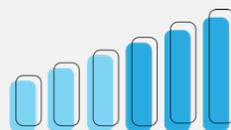
## Auxiliary Concept: Chemical Applications Cont.

### Performance Goal for High School Learners

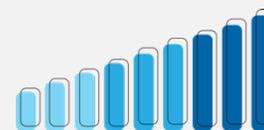
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Basic



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### CORROSION

I can define corrosion while providing a specific example.

I can explain the factors influencing the corrosion of metals.

I can analyze the corrosion rate of a material in a given environment to recommend ways in which to control the corrosion of a material within a specific application.

### MEMBRANE SCIENCE

I can define natural and synthetic membranes with examples.

I can explain membrane processes and configurations.

I can illustrate applications of membranes with examples.