Experiment Hazard Analysis(EHA)

实验室工作危害分析指导书

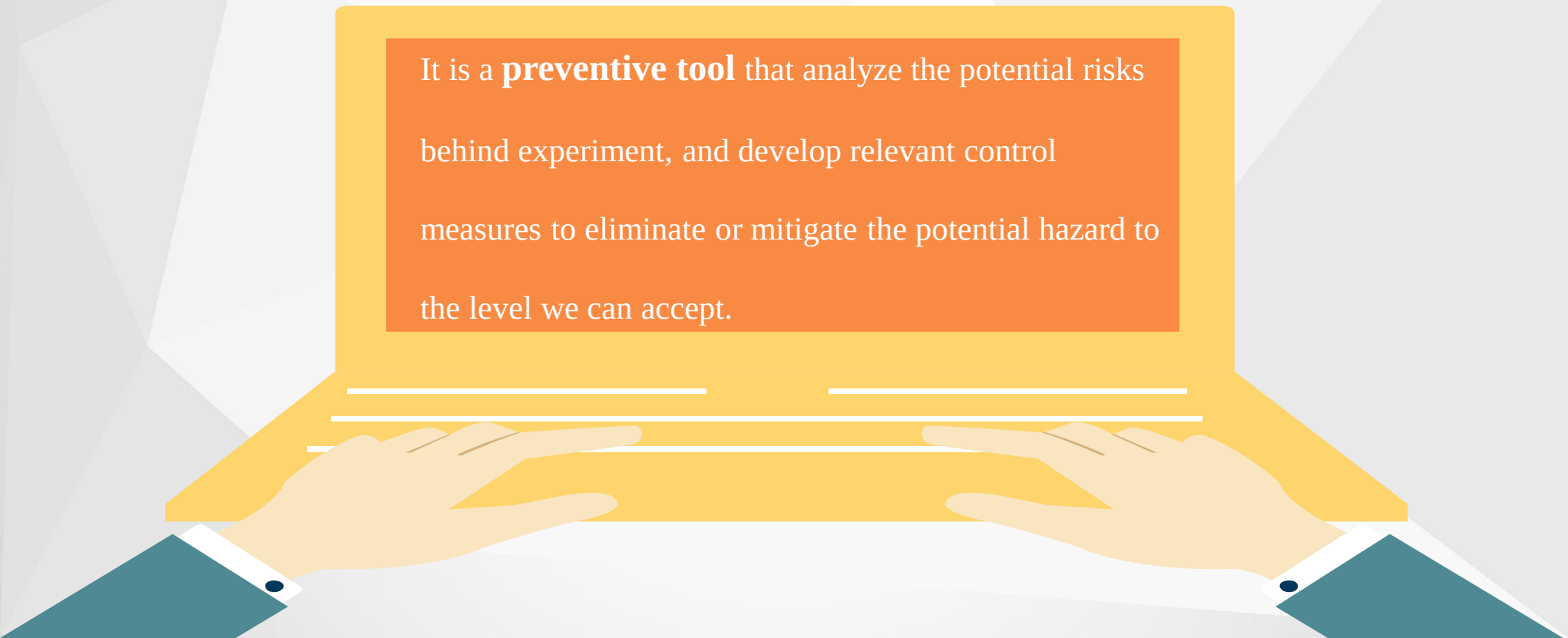
CONTENTS

What is EHA

What is EHA

EHA: Experiment Hazard Analysis

It is a **preventive tool** that analyze the potential risks behind experiment, and develop relevant control measures to eliminate or mitigate the potential hazard to the level we can accept.



Why we need EHA

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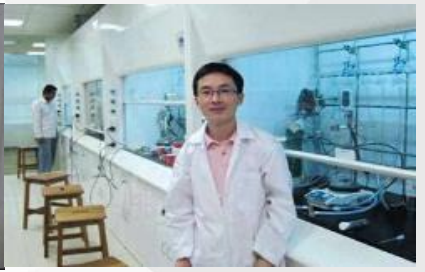
Bacteria Infection
细菌感染

Chemical Explosion & Corrosion
化学品爆炸或腐蚀



Operation Violation
违规操作

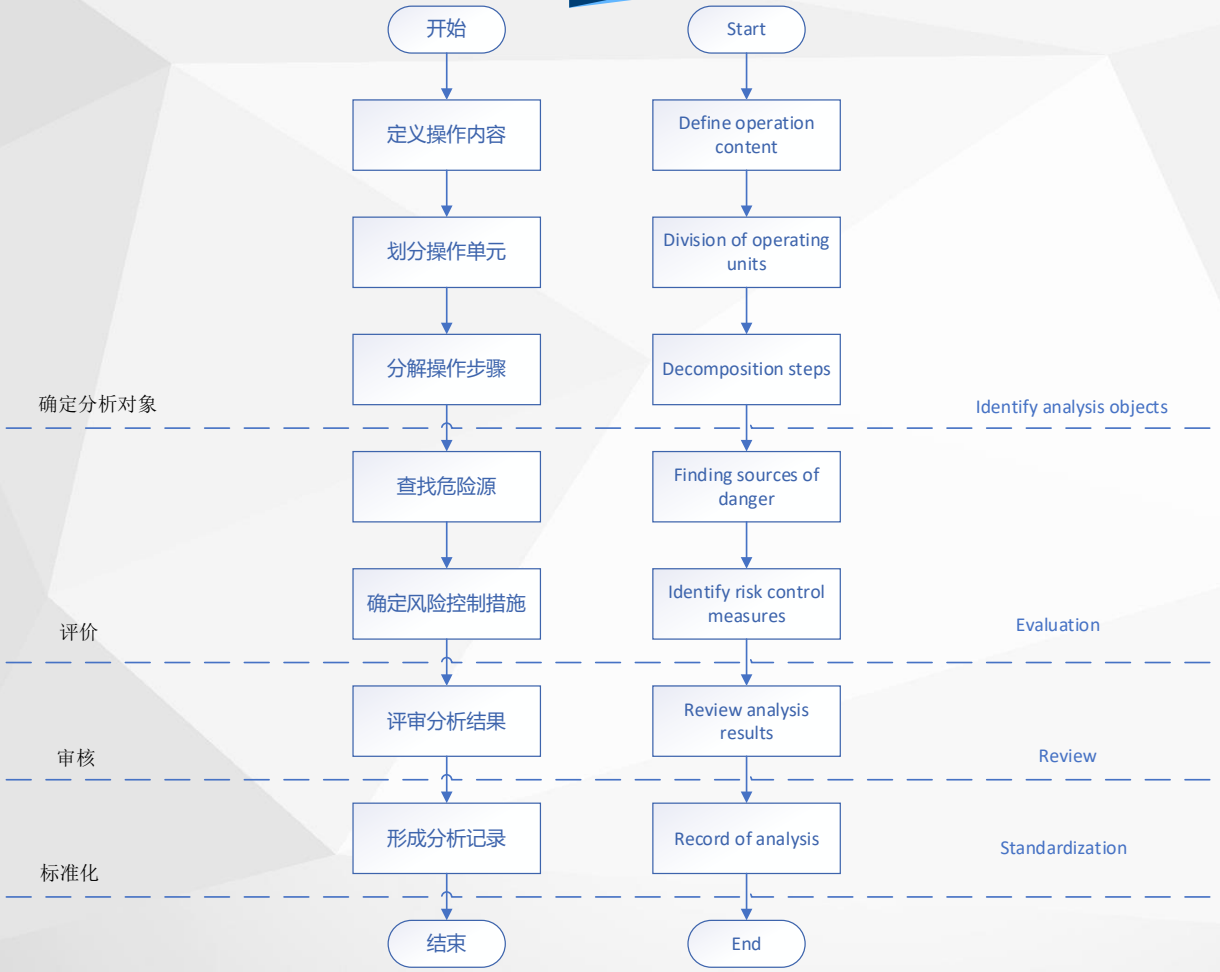
Protect Staff & Students
保护教员及学生

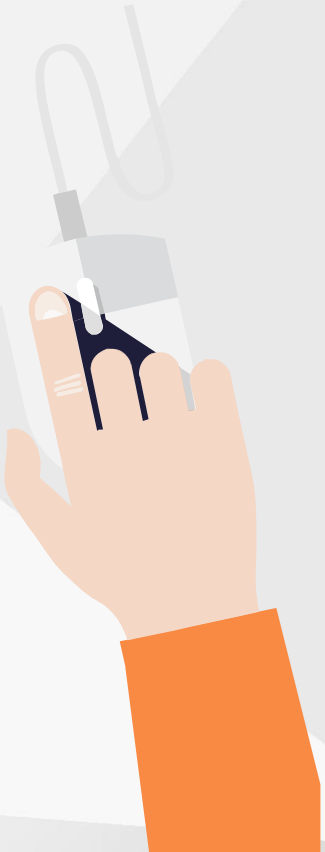
Why we need EHA

Because there are various risks during experiment, before starting the experiment in lab, in order to standardize the safety behavior and working requirements in labs to prevent incidents happen to people, environment and property. Experiment Hazard Analysis(EHA) is required to control the potential risks(cover the risk management).

How to do EHA

Flowchart


开始
定义操作内容
划分操作单元
分解操作步骤
确定分析对象
查找危险源
确定风险控制措施
评价
评审分析结果
审核
形成分析记录
标准化
结束
Start
Define operation content
Division of operating units
Decomposition steps
Identify analysis objects
Finding sources of danger
Identify risk control measures
Evaluation
Review analysis results
Review
Record of analysis
Standardization
End



Identify Analysis Objects

Define operation content or analysis object

Identify what needs to be assessed for risk, such as experiment content, lab location, etc.

Collect information about operations

Collect the following information as evidence for a safety analysis, such as experimental equipment, materials, etc.

Decomposition

Each step contains as many actions as possible to make the description easy to be understood.

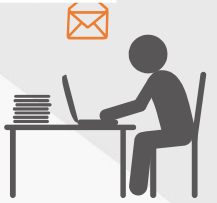
e.g.

Name or Topic 实验名称:	Experiment#10-- Electrophilic Addition to Olefin followed by Elimination
Brief Introduction of Experiment 实验内容简述: The experiment deals with addition of bromine to crotonic acid and is performed in the catalysis of a light source.	

Bromine

Hazards	
GHS pictograms	
GHS Signal word	**Danger**
GHS hazard statements	H314, H330, H400
GHS precautionary statements	P260, P273, P280, P284, P305+351+338, P310[57]
NFPA 704 (fire diamond)	[58] 

Step	
Chemical storage	……
Chemicals preparation	……
During the experiment….	……
After the experiment, the waste handle	……
…….	……



Analysis

Finding sources of danger

Find the source of danger from physical, chemical, biological, physiological, behavioral and other six types of dangerous and harmful factors.

Identify risk control measures

Identify the control measures to reduce the risk to an allowable level

e.g.

Step	Risks behind the steps	Control Measures
Chemical storage	Someone take the chemicals or using it in other area.	Storage the chemicals in a double locked cabinet; put them back to the cabinet and do record after every use.
During the experiment	Long-term exposure may cause symptoms of mucosal irritation and neurasthenia and other occupational diseases	Prepare a low-concentration bromine solution for the students and make sure that the students work in a fume hood.
	Improper operation that cause the vessel broke lead to a spill	Before the experiment, pay attention to the glass vessels and check that there are no cracks. If some solution leaks, treat with a **sodium thiosulfate solution** in a special flask used for this process
After the experiment, the waste handle	The bromine solution could not completely react, and bromine solution appeared in the waste liquid.	Increase the concentration of reactants or use the sodium thiosulfate to completely react the raw material bromine solution.
. . . . .	. . . . .	. . . . .

Review

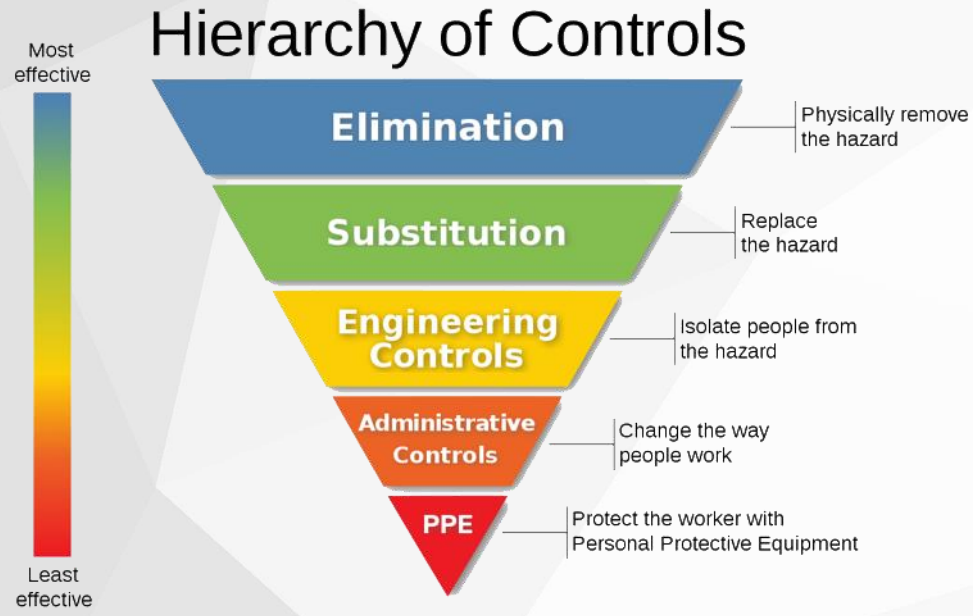
After the risk control measures are determined, they shall be reviewed. The review includes the following aspects:

- Whether the control measures reduce the risk to an **allowable level**;
- Whether control measures have created **new** sources of danger;
- The **necessity** and **practicability** of control measures.

e.g.

Control Measures	Risk grade
Storage the chemicals in a double locked cabinet; put them back to the cabinet and do record after every use.	low
Prepare a low-concentration bromine solution for the students and make sure that the students work in a fume hood.	low
Before the experiment, pay attention to the glass vessels and check that there are no cracks. If some solution leaks, treat with a **sodium thiosulfate solution** in a special flask used for this process	low
Increase the concentration of reactants or use the sodium thiosulfate to completely react the raw material bromine solution.	low
. . . . .	. . . . .

Implement



Measure	Feasibility
Do not use bromide to process the experiment	✗
Replace bromide with other low risk chemicals	✗
Process the experiment inside the fume hood	✓
The tutor will prepare the solution for students	✓
Work with proper PPE during the experiment	✓

Regular review and update

Hazard assessment records for special positions in the laboratory or Campus are valid for one year and are reviewed at least **once a year**.

When an incident occurs in a special post in a laboratory or campus, the post hazard assessment record should be updated based on the results of the incident investigation.

How to get help from EHS

Phone number:
8807 7079
8807 7150
8807 7168

Office:
A202

Website: *https://sites.gtiit.edu.cn/ehs/*

If you have any question or need any support,

EHS are glad to assist you to do the EHA!

Nothing we do is worth getting hurt for !

我们所做的一切都不值得为之受伤！

EHS office