

## Modifications from the 2021 edition of the Safety Management Guidelines for Research Activities

- "Course" changed to "Program (PG)" due to reorganization of the Graduate School.
- Correction regarding the fact that the confirmation documents regarding safety training will be registered in the web form.  
→Revised Section 3 (2) (3), deleted Form 1.2
- Modifications were made regarding the submission of inspection results for toxic and deleterious substances via a web form.  
→Revised Section 5.2.3 (10)
- Mention that the part regarding risk assessment may be revised in accordance with the revision of the Occupational Health and Safety Law.  
→Added to Section 5, 2.1(9) and Form 8.
- Revised Table 2 : "List of Industrial Waste Classification" and "Layout of the collection points" .
- Revised Table 8: "Collection Category of Liquid and Material Waste in the Experiment".

## Section 3 Steps for Safety Training before Starting Research Activities

- (1) Any persons consistently engaged in research activities, such as the school staff members, students, and graduate research students in the Graduate School of Science and Engineering (or Faculty of Science and Faculty of Engineering) must receive safety training according to these Safety Management Guidelines before starting any research activities.
- (2) The safety training provided before the start of research activities must be provided by the Safety Management Supervisor (school staff; or Health Supervisor, Health Promoter). The person who provides the safety training must thoroughly explain the contents of these Safety Management Guidelines. ~~After completing the safety training, the persons who provided and received the training must sign the Confirmation Sheet on Safety Management (Form 1).~~
- (3) **After completing the safety training, the safety training provider registers the content of the safety training conducted through the web form. The person who received the safety training must respond to the confirmation of the content of the training sent by e-mail. The Graduate School of Science and Engineering Support Office will keep a record of these responses.**
- (4) After completion of the steps above, the start of the research activities is authorized. No operations, such as an experiment, can be performed without completing these steps.
- (5) The Safety Training may be exempted when the period of operation, such as the experiment, is less than two weeks in aggregate in each year, and the operation is made with the full attendance of school staff members, considering that such operation is a laboratory or visitor tour. To the persons who are considered to receive equivalent safety training by a different organization, safety training considering the actual state of the Graduate School must be provided.
- (6) Provision of safety training should not be limited to the time when the research activities are being started. Safety training should be provided by the Safety Management Supervisor as appropriate when the operation procedure is changed or during the periodic inspection, and the safety training herein defined is the minimum requirement.
- (7) The administrative office staff members need to receive safety training up to Section 4 “General Precautions” of these Safety Management Guidelines. Persons who are engaged in the research of special subjects involving experiments must receive explanations of all related subjects within and following Section 5.

- (2) When handling a chemical, investigation as to whether such substance is regulated by laws and regulations in advance shall be made. When a certain legal procedure is required, the fact must be reported to the Health Supervisor, and such procedure should be made by the Safety management Supervisor.
- (3) With respect to the especially hazardous substances due to toxicity, flammability, or explosivity, whether the use of such substance cannot be avoided, whether an alternative substance is available, and other information should be examined from the planning stage of the experiment to minimize the use of such especially hazardous substance.
- (4) In this subsection, the substances specified by the following laws and regulations are regarded as hazardous chemicals whose handling must be made with special care. Even though a chemical is not designated as hazardous, the provisions here must be applied if equal hazard levels are anticipated.
  - (a) Organic Solvent (Ordinance on the Prevention of Organic Solvent Poisoning, (Organic Solvent Ordinance))
 

Total 44 types of solvents in Classes 1, 2, and 3 and the mixtures thereof [Table 3]
  - (b) Specified Chemical Substances (Ordinance on the Prevention of Hazards Due to Specified Chemical Substances)
 

Total 74 types of specified chemical substances in Classes 1, 2, and 3 [Table 4]
  - (c) Toxic Substance (Poisonous and Deleterious Substances Control Act)
 

Total 27 types of toxic and specified toxic substances and the substances specified separately [Table 5]
  - (d) Deleterious substance (Poisonous and Deleterious Substances Control Act)
 

93 types of deleterious substances and the substances specified separately. [Table 6]
  - (e) Hazardous Materials (Fire Service Act)
 

Categories 1 to 6 [Table 7]
- (5) Handling of the hazardous chemicals must comply with the laws and regulations above and the Hazardous Material Storage Management Manual of the Graduate School of Science and Engineering.
- (6) The hazardous chemicals must not be used for a purpose other than research activities. The hazardous chemicals must not be brought outside the School.
- (7) Carriage and handling of hazardous chemicals must be made by the person who has adequate knowledge of such chemicals.
- (8) When handling hazardous chemicals, adequate care must be taken to prevent scattering, leakage, loss, and inhalation of the vapor of the hazardous chemicals. A strong container with the cap or lid installed must be used to prevent spillage, leakage, seepage, or dispersion of hazardous chemicals.
- (9) The Safety Management Supervisor of the laboratory where hazardous chemicals are handled must check the storage condition and the quantity of the hazardous chemicals in the laboratory as appropriate and must implement the actions required to maintain the health and safety of all persons. The Safety Management Supervisor of the laboratory must conduct a risk assessment once every year based on the Questionnaire (Form 8) and must submit the survey results to the Support Office of the Graduate School of Science and Engineering according to the Industrial Safety and Health Act.

**\*The method of conducting risk assessment may be modified in accordance with revisions to the Occupational Health and Safety Law.**

- (10) The condition of the toxic and deleterious substances must be entered on the check sheet (Form 5) for any abnormal condition at least once every year according to the Poisonous and Deleterious Substances Control Act (Standards for Structure and Equipment for Storage of Toxic and Deleterious Substances), and the results of the check must be **submitted to the Graduate School of Science and Engineering Support Office. These results must be retained for three years.**

#### 5.2.4 Handling of metallic mercury and mercury compounds

Any person who is in possession of mercury (metallic mercury, mercury reagent, etc.) must implement the measures for storage based on the guidelines for the storage of mercury according to the Act on Preventing Environmental Pollution by Mercury. Any person who stores mercury exceeding a certain amount must submit the information on the amount of storage and usage periodically. The method of disposal of materials containing mercury will vary depending on the concentration of mercury compounds contained under the Waste Management and Public Cleansing Act.

- (1) Mercury to which appropriate storage is particularly required for environmental considerations under the Act on Preventing Environmental Pollution by Mercury are the following compounds:
  - (a) Mercury (including amalgam with other metals)
  - (b) Mercury chloride
  - (c) Mercury dioxide
  - (d) Mercury disulfate
  - (e) Mercury dinitrate and its hydrate, and mercury disulfate (including those contained in cinnabar)
- (2) The following rules must be followed with respect to the guideline for storage of mercury:
  - (a) The container that can ensure no scattering or spillage of mercury must be used, and the name of mercury contained must be indicated in a prominent place on the container.
  - (b) The name of mercury must also be posted in the place where mercury is stored.
  - (c) The place where mercury is stored must be constantly locked.
- (3) The purchase amount and consumption of chemicals containing mercury must be registered in IASO. If dead storage of such a chemical is found, it must also be registered in IASO.
- (4) When liquid waste containing a mercury compound is brought out of the premises, the concentration of such a mercury compound must be indicated. Accordingly, when liquid waste is stored in the laboratory, adequate care must be paid.
- (5) When solid waste containing a mercury product is brought out of the premises, the fact that the waste contains a mercury product must be indicated. Accordingly, adequate care must be paid when the device containing a mercury product is brought out of the premises.

#### 5.2.5 Handling of hazardous materials with ignitability, flammability, and explosivity

Great care must be paid as shown below with respect to the hazardous materials with ignitability, flammability, and explosivity specified by the Fire Service Act (Table 7).

**Table 2 List of Industrial Waste Classification**

Class	Typical Items	Method of Transfer	Notes	Disposal Site	Trash Collection Day & Time	
General Waste	Combustible Waste	<ul style="list-style-type: none"> <li>Kitchen garbage (Kitchen garbage, lunchbox waste, instant noodle cup waste, and other trash)</li> <li>PVC rubbish</li> <li>Leather products</li> <li>Cloth</li> <li>Branches and leaves</li> </ul>	<ul style="list-style-type: none"> <li>Take out after separating and packing in clear PVC bags by type of waste.</li> </ul>	<ul style="list-style-type: none"> <li>Kitchen garbage should be properly dewatered and taken out.</li> <li>Branches should be cut to less than 90 cm and bundled before putting out.</li> </ul>	Collection place on campus (Combustible waste)	As required
	Recyclable Waste	<ul style="list-style-type: none"> <li>Wastepaper (newspapers, magazines, cardboard, etc.)</li> <li>Recyclable paper trash (paper trash, such as envelopes, paper pieces, shredded paper, paper file boxes, and used tissues)</li> </ul>	<ul style="list-style-type: none"> <li>Take out after bundling with string.</li> <li>Take out by packing in clear PVC bags.</li> </ul>	<ul style="list-style-type: none"> <li>Brought outside the campus and recycled by the waste management contractor.</li> </ul>	Collection place on campus (wastepaper and recyclable paper trash)	As required
		<ul style="list-style-type: none"> <li>Beverage cans, plastic bottles, glass bottles from vending machines, etc.</li> </ul>	<ul style="list-style-type: none"> <li>Place in the recycle bins located near the vending machine.</li> </ul>	<ul style="list-style-type: none"> <li>Brought outside the campus and recycled by the vending machine operator and college coop.</li> </ul>	Beverage can recycle bin	As required
Industrial Waste	Incombustible Waste	<ul style="list-style-type: none"> <li>Reagent bottles</li> </ul>	<ul style="list-style-type: none"> <li>Large items should be disposed of without packaging.</li> <li>Smaller items should be disposed of packed in clear PVC bags or solid containers (18-liter square cans etc.)</li> </ul>	<ul style="list-style-type: none"> <li>Rinse inside the bottle before disposal.</li> <li>Dispose of without the cap.</li> </ul>	Industrial waste Collection place	<p>Thursday and Friday 10:00–16:00 (except 12:15-13:15) Please check with your academic advisor or the Asset Management Center (048-858-9746) for specific dates and times.</p> <p>Press the intercom.</p> <p>Advance notice is required for disposal (Ext.: 3478)</p> <p>To be brought in with the rolling door open. Be sure to close the door after delivery.</p>
		<ul style="list-style-type: none"> <li>Plastics and PVC products, styrene foam (including items used in experiments)</li> <li>Either side open document folders (all metal)</li> </ul>	<ul style="list-style-type: none"> <li>Take out by packing in clear PVC bags.</li> </ul>	<ul style="list-style-type: none"> <li>Empty the container or bottle used in the experiment before disposal.</li> </ul>		
		<ul style="list-style-type: none"> <li>Sharp glass rubbish (including those used in the experiment) (Broken glass rubbish, Pasteur pipettes, microsyringes, gas-tight syringes, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>Take out by packing in solid containers (18-liter square cans)</li> </ul>	<ul style="list-style-type: none"> <li>Attach the label indicating the contents.</li> </ul>		
		<ul style="list-style-type: none"> <li>Glass rubbish not sharp (including those used in the experiment) (Bottles other than the beverage bottles, vial bottles, sample bottles, and incandescent lamps (excluding bulb-type fluorescent lamp )etc.)</li> </ul>	<ul style="list-style-type: none"> <li>Take out by packing in clear PVC bags or solid containers (18-liter square cans)</li> </ul>	<ul style="list-style-type: none"> <li>Be sure to empty the contents before disposal.</li> </ul>		
		<ul style="list-style-type: none"> <li>General syringe barrels (plastics), Terumo syringes, etc.</li> </ul>	<ul style="list-style-type: none"> <li>Take out by packing in clear PVC bags.</li> </ul>	<ul style="list-style-type: none"> <li>Attach the label indicating noninfectious waste.</li> </ul>		
		<ul style="list-style-type: none"> <li>Disposable pipette tips, disposable centrifuge tubes, petri dishes, etc. used in experiments</li> </ul>		<ul style="list-style-type: none"> <li>Be sure to empty the solution contained in the pipette tip before disposal.</li> </ul>		
		<ul style="list-style-type: none"> <li>Spray cans, lighters, gas canisters, etc.</li> </ul>		<ul style="list-style-type: none"> <li>Empty the spray can before disposal.</li> </ul>		
	<ul style="list-style-type: none"> <li>Pottery rubbish and aluminum foil</li> </ul>					
Bulky Waste	<ul style="list-style-type: none"> <li>Furniture, fixtures, and equipment</li> <li>Tires</li> <li>Waste material of 90 cm or more in size</li> <li>CRT displays</li> </ul>	<ul style="list-style-type: none"> <li>Transfer to the designated area in the industrial waste collection place.</li> <li>Please separate rechargeable batteries into "lithium-ion batteries", "nickel-cadmium batteries", and "nickel-metal hydride batteries".</li> <li>Button and lithium batteries should be insulated with cellophane tape, etc.</li> </ul>	<ul style="list-style-type: none"> <li>Maximize reuse of furniture, fixtures, equipment, etc. for effective use of resources and for cost reduction.</li> </ul>			
Hazardous Waste	<ul style="list-style-type: none"> <li>Fluorescent tubes (including bulb-type fluorescent lamps)</li> <li>Dry cells, rechargeable batteries, etc.</li> </ul>		<ul style="list-style-type: none"> <li>Rechargeable batteries should be placed in the separate bin for dry cells.</li> </ul>			

# 分別回収にご協力をお願いします

## 構内7カ所集積所

資源物 (古紙・紙ゴミ)		一般廃棄物 (燃えるゴミ)	
古紙類 ・新聞 ・雑誌 ・ダンボール 等	リサイクル紙ゴミ ・封筒 ・紙袋 ・シュレッダーゴミ ・紙コップ 等	ゴミ収集庫 ・生ゴミ ・弁当から ・汚れた紙ゴミ ・布きれ 等	剪定枝 ・枯れ葉 ・刈草 等

(注)空き飲料びん・カン・ペットボトルは、自動販売機近くに設置した「飲料缶等回収ボックス」に入れてください。ペットボトルはつぶして出してください。

○資源物集積所及び産業廃棄物集積所(事務局東側倉庫)は、受入時間帯のみ開放しています。

- 受入は、木曜、金曜、10時～16時の間のみです。
- 持ち込み前に、必ず「財務課資産管理センター」048-858-9746 に電話してください。
- 分別表示に従って集積してください。
- 内容物が外から確認できない場合は、内容物及び搬出者の連絡先の表示・貼付してください。

○状態の良い物品は、リユース可能か経理課の判断を受けてから廃棄してください。

- リユースについてのお問い合わせ先：経理課 事務局等担当係 048-858-3016
- 学部等担当係 048-858-3935

## 資源物集積所

### リサイクル家電

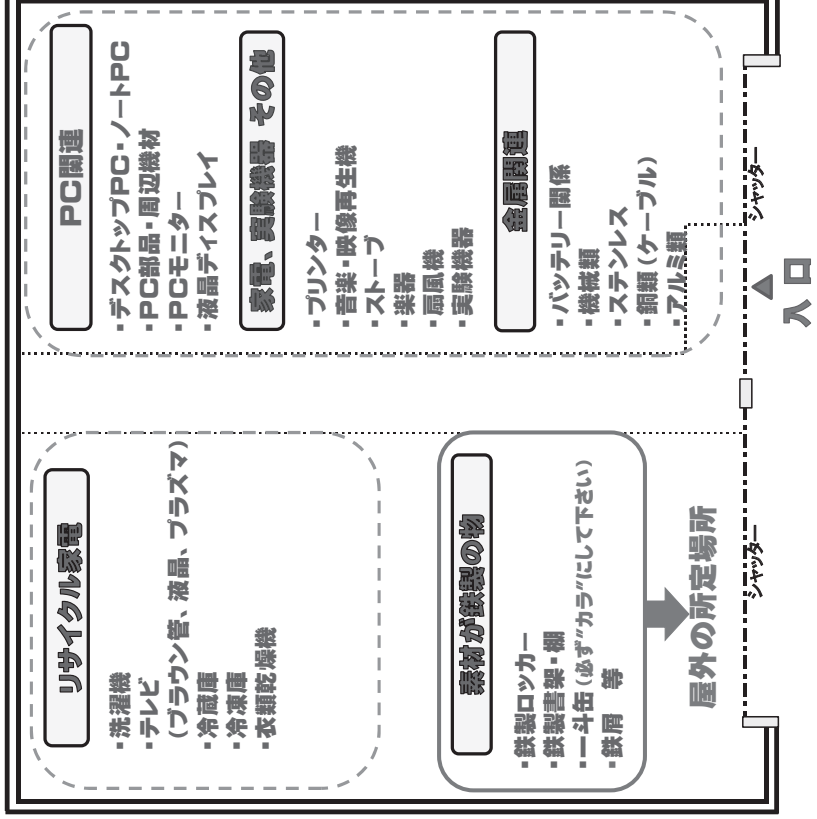
- 洗濯機
- テレビ (ブラウン管、液晶、プラズマ)
- 冷蔵庫
- 冷凍庫
- 衣類乾燥機

### 素材が鉄製の物

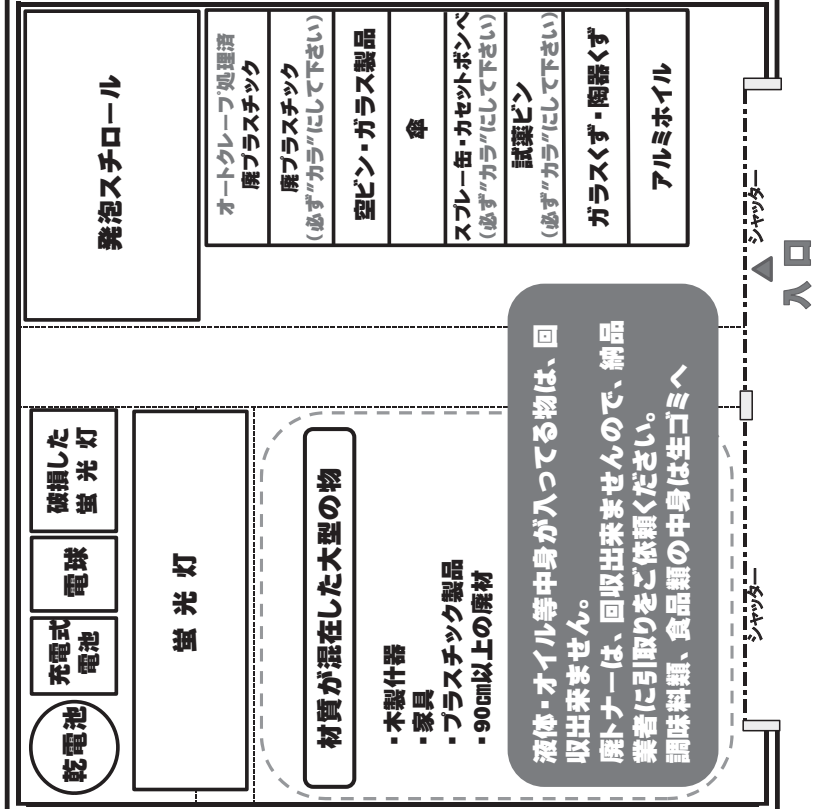
- 鉄製ロッカー
- 鉄製書架・棚
- 斗缶 (必ず「カラ」にして下さい)
- 鉄屑 等

### 屋外の所定場所

## 分別配置図



## 産業廃棄物集積所



## Table 8 Collection Category of Liquid and Material Waste in the Experiment

Category		Subject	Summary	Container
Inorganic Liquid Wastes	General heavy metal containing liquid waste	Aqueous solution not containing hazardous metal and acidic and alkaline aqueous solution		Grey 16 L
	Hazardous metal-containing liquid waste	Aqueous solution containing <del>hazardous metals, such as</del> lead, arsenic, cadmium, chromium, and selenium		Grey 16 L
	Cyanide containing liquid waste	Aqueous solution containing cyanide	Store maintaining pH at 10.5 or above	Yellow 20 L
	Hexacyanide containing liquid waste	Aqueous solution containing ferrocyanide salt, ferricyanide salt, etc.	Adjustment of pH not required	Grey 20 L
	Mercury compound containing liquid waste	Aqueous solution containing mercury compound	Metallic mercury is not allowed	Green 20 L
Organic Liquid Wastes	Flammable solvent wastes	Water soluble organic liquid waste like methanol, ethanol, acetone, and non-water soluble organic liquid waste like benzene, toluene, xylene, hexane, and ethyl acetate	When containing ether, adjust ether percentage less than 10%.	White 20 L
	Flame resistant/incombustible solvent waste	Organic liquid waste containing halogen (chloroform, carbon tetrachloride, methylene chloride, etc.), nitriles		White 20 L
	Waste oils	Machine oil, engine oil, pump oil, insulating oil, vegetable oil, cutting fluid, etc.	Excluding the item containing PCB	White 20 L
	Cyanide containing solvent waste	Organic liquid waste containing cyanide	Store maintaining pH at 10.5 or above	Yellow 20 L
	Hexacyanide containing solvent waste	Organic liquid waste containing ferrocyanide salt, ferricyanide salt, etc.	Adjustment of pH not required	White 20 L
	Photographic liquid waste	Developing fluid and stop solution Fixing solution	Use the tank dedicated for photographic fluid waste.	Grey 20 L
	Heavy metal containing solvent waste	Organic fluid waste containing heavy metals		White 20 L
	Mercury compound containing solvent waste	Organic fluid waste containing mercury compounds	Metallic mercury is not allowed	Green 20 L
Solids	General filter paper waste and cloth waste	Filter paper and cloth waste attached with oils, oil paints, poster paints, and hazardous substances		Strong container like an 18-liter square can
	Filter paper and cloth waste attached to hazardous metals	Filter paper and cloth waste attached with hazardous metals etc.	Lead, arsenic, cadmium, chromium, selenium (to be collected separately)	
	Filter paper and cloth waste attached to mercury compounds	Filter paper and cloth waste attached with mercury compounds	<b>Metallic mercury is not allowed.</b>	
	General solid waste (1)	Solids, such as silica gel, molecular sieve, activated carbon, and calcium chloride, absorbing hazardous substances (solvents etc.)		
	General solid waste (2)	Solids like TLC plates		
	Hazardous metal attaching solid waste	Solids attached to hazardous metals ( <del>lead, arsenic, cadmium, chromium, selenium</del> ) etc.	<del>Lead, arsenic, cadmium, chromium, selenium (to be collected separately)</del>	
Others	Metallic mercury	Metallic mercury, mercury amalgam, mercury thermometer (broken), mercury manometer	Contact the Comprehensive Analysis Center for Science (Cost for disposal should be charged to those who discharge the waste).	
	Reagent waste	Inorganic reagent waste, organic reagent waste, and solid waste		
Infectious Waste	Syringe needle	Syringe needles used for microsyringes, gas-tight syringes, Terumo syringes, disposable syringes, etc.	Contact the Comprehensive Analysis Center for Science	To be placed in the special box
	Body of the experimental animals etc.	Bodies of experimental animals and pathological waste, such as items attached to blood, organs, and tissues		

Note) Solids must be taken out by putting in the PVC bag and then in the container, such as an 18-liter square can, to prevent the contents from spilling.