Metamorphosis

Patinated Jewelry and Exploration of Forms

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Abstract

Patination is a method to colorize metal without having to apply actual paint on the surface. Since it commonly appears in nature, with patina it is possible to create beautiful effects without a loss of naturalness.

This thesis aims to explore a wide range of possible patina colors and techniques. Using metals commonly used in jewelry studios, a patina recipe book was created in order to illustrate the effects of different chemicals and techniques on various materials. As a result, it was later applied on wearable jewelry.

Striving between unique decorative art and the practice of minimalism, a set of necklaces was designed ranging from complex to simple forms. During this process, several procedures such as casting and electroforming have been used. A butterfly shape, which emerged from an organic object, has been the inspiration for the set. It was gradually simplified in order to turn from a decorative body art to a simple costume jewelry. The challenge posed here was to align jewelry pieces of different characteristics into a set, and to achieve colorful patina on pure silver.

Keywords: patina, art jewelry, serial production, necklace, butterfly, electroform, cast.
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I N T R O D U C T I O N

Being fortunate enough to attend two universities with different aspects toward jewelry design inspired me in a unique way and allowed me to learn a variety of different skills.

The former university, the University of Kansas, encouraged my great passion toward jewelry making. In that university my wildest imaginations came to life in the form of metal and clay. However, the surface colors of these materials have always been of my concern. I usually picture new creations in various colors and I imagine which combination of color and shape would match best. One elegant possibility to colorize metal is patina. Fortunately, I was provided with a patina guidebook that gave me a visualization of some possible colors on metal. Since I left the University of Kansas, I also lost that guide to patination.

However in the latter university, the Lahti University of Applied Sciences, I wasn’t provided with such an illustrated guide book and I realized the students are missing out an important technique. Therefore, I chose patina as my topic in order to introduce the same metal coloring techniques to my fellow students. I devoted myself to create a patina recipe book using metals commonly used in jewelry studios. Besides testing existing patination techniques, I also evaluate and propose new application methods such as wrapping the metal with wood strips.

On the other hand, the Lahti Design Institute greatly encouraged me to practice the art of less-is-more minimalism. For being a Paraguayan and coming from a South American/Asian culture where everything is “the more the merrier”; practicing the art of minimalism has been of great challenge for me. Yet, I wanted to take this challenge since I also believe simple design is essential in everyday jewelry.

Within this thesis, I aim at creating a piece of jewelry and gradually simplified my own design. The inspiration comes from organics shapes, which begins at an elaborate piece and will step down to become a simplified version of itself. Patina is later applied on each item in the set, which shows elegantly the connection between the pieces and demonstrates the benefits of patination in jewelry.

Since I design complex and simple pieces, there are two target groups of women with opposite tastes. However, as I am applying patina on the jewelry, it is clear that all the targeted women are to be open minded toward novelties and have a young and colorful spirit.

Being aware of these goals, I began experimenting with the patina recipes, which makes up for the main part of this thesis. During the process of making the jewelry, I encountered various problems, such as metal forming, form fitting, design changes, or patina coloring problems. As jewelry designer, those problems are part of the daily work and thus actions to solve them were taken accordingly.

The remainder of this book is structured as follows. Chapter 2 gives an introduction to patina. Chapter 3 specifies the design task. In chapter 4, I describe the different patina application techniques used to produce the recipe book, which is presented in chapter 5. For the design task, the several steps to create the set are illustrated in chapter 6, which is followed by descriptions of the production and the finished set in chapter 7 and 8 respectively. The evaluation in Chapter 9 concludes this thesis.
2 Patina

2.1 The Origin of Patina

Patina is the tarnish on a metal surface caused by oxidation or by the reaction of chemicals with a metal alloy.

According to Tim McCreight and Nicole Bsullak, patinas were almost certain to be the first form of color on metal since patinas can happen naturally when the metal is exposed to nature (McCreight 2001, 9).

An example of a natural patina is the rust that can be seen on an old metal fence, a barbed wire, an abandoned ship, or sometimes even on the roof. All these are types of patina formed by very slow reactions of metal with oxygen and water.

In metal smithing, jewelers or smiths try to control these reactions by applying chemicals or heat to the metal, forcing it to react on the place and the color that is desired.

Although there are ways to control patina; nevertheless, the resulting colors can vary tremendously along with small changes of temperature or the application technique used. This is why most jewelers and smiths would agree that one of the characteristics of patinas is its unpredictability. (McCreight 2001,8.)

2.2 Traditional Applications of Patina in Art

Patina has already been used for many centuries and can be found in many metalwork traditions. Patina has been applied predominantly on sculptures and ritual vessels, and it has habitually been practiced on copper and its alloys. (Hughes 1991, 6.) Furthermore, archaeologists have found small pieces of textile underneath some patinated objects in graves or tombs. (Henshall 1951.6.) It turned out that oxidized metal can preserve fabric for a long time; however, this only holds for the small area that is right underneath the metal.

Now, in the twenty first century, patina is still used mostly on large statues or sculptures and very little in jewelry. Patina usage is as Tim McCreight and Nicole Bsullak stated in “Color on Metal” as “patinas on vessels and enamels on jewelry” (McCreight 2001, 7.)

3. Design Task Specification

3.1 Subjects of the Design Task

I am set to design a patinated jewelry series that shows the process from a complex to a simple form. Additionally, since I am studying jewelry design, I am primed to set the outcome to be wearable jewelry, as opposed to sculptures of other traditional objects of patina applications.

Color is often a key factor in the visual coherence and significance of objects and of paramount importance. In addition, it is a directly observable symptom of change and has been used as an indicator of the state of the material. (Hughes 1991, 9.)

In jewelry, color is usually deemed as an indicator of the material; yellow equals to brass or gold, orange means copper, and white implies the material to be silver. However, if there are other colors involved, it most likely will completely change the character and appearance from the original piece. This is why it is important to have a test chart at hand to thoroughly consider each patina color before applying it on the surface, in order to best fit the impression that one wishes to create.

Since the resulting piece will be patinated, it is part of this thesis to research the possible colors and patterns that can be achieved with patina. As mentioned earlier, results of patina-
4 Process and Patina Application Techniques

4.1 Basic Procedure

Patina is usually applied on copper or brass surfaces. However, I did not intend to apply it only on statues or vessels since every metal alloy reacts to the chemicals in a different way. I decided to test different materials that are commonly used in the jewelry studio, which are in particular copper, brass, sterling silver, nickel silver, and silver plated copper.

Of great importance in patination is the surface. All metal surfaces should be readily prepared the way they are intended, whether polished or rough. Patinating the metal will not hide defects of the surface; in addition, it might bring out some defects that were previously unnoticed on a polished surface. (Hughes 1991, 23.)

After having the surface ready, it is essential to degrease and clean the metal before application. Any grease or dirt, including fingerprints, will prevent coloring on metal and all the work must start over. Degreasing and cleaning can be achieved by a number of methods, such as immersing the object into a mixture of hot baking soda and water.

Another way that I performed on my pieces is to heat the metal with a torch, clean it in the acid, then brass brush the piece, and leave it under water prior to application. I chose this method because to create a jewelry or sculpture, the metal will most likely go through all those steps before the jewelry is ready and complete.
A chemical solution is brushed, dabbed, or wiped on the metal with a soft brush or a soft cloth. The surface should be left only slightly moist. The object is then left to air dry completely and application repeated until desired color is reached. Some results can be accomplished instantly; some may take several hours or several days. This technique is used commonly in the jewelry studio to darken the silver with the liver of sulfur solution.

4.2 Brushing, Dabbing or Wiping Technique

This technique is well known to sculptors as it is the most applicable one to large objects. The color develops by consecutively heating the metal with a torch and then applying the solution with a brush on the heated area, or spraying the solution on the object. (Hughes 1991, 36.)

The result in torch technique can be seen instantly when the flame hits the metal; however, caution is advised when the solution is heated, it tends to splash around causing chemical stains around the working area.

4.3 Torch Technique
The object to be colored is hung or held in a vessel of cold, warm, or boiling solution during the coloring process, and is kept away from the bottom and the walls of the vessel. The suspension used for this process should support an easy removal and replacement of the object for examination of the color during the process. (Hughes 1991, 29.)

Colors from this technique tend to be duller. In addition, the solution dries out leaving layers of color on the metal when the solution vaporizes during the boiling technique.

**4.4 Immersion Technique**

Immersion patina sample 8 from the test chart

| Copper | Brass | Silver Plated | Nickel Silver | 925 Silver |

The solid ingredients are grounded with the liquid component to a creamy paste with a pestle and mortar. The pastes are then applied on the object with a brush or a soft cloth and dried thereafter. The application is repeated until the desired color has developed. (Hughes 1991, 35.)

This technique commonly needs the process to be repeated at least once for a visible reaction and it generally takes several days to accomplish. Colors in this technique tend to give a slight granulate texture.

**4.5 Paste Technique**

Paste patina sample 26 from the test chart

| Copper | Brass | Silver Plated | Nickel Silver | 925 Silver |
4.6 Vapor Technique

In this technique, the object is placed in a container with a solution that will release vapor or gas. The solution is placed in a cup or bowl without any contact to the object; the container is then sealed for a certain time and the color will develop on the object by the exposure to the vapor or gas in the container. (Hughes 1991, 38.)

Taking into account that the solution does not come into direct contact with the metal, the resulting colors from this technique are surprisingly strong and scratch resistant.

Vapor patina sample 4 from the test chart

4.7 Sawdust Technique

The chemical solution is first mixed with dry sawdust; the object is then buried in the moist sawdust and left for a period of time. Those areas that are in contact with the sawdust will produce spots of colors. If the desired color is not achieved, the object may be reburied in the sawdust for a longer period of time. (McCready 2001, 9.)

The color result in this technique is unique by its texture, depending on the size of the sawdust; the pattern of the patination may vary tremendously.

Sawdust patina sample 42 from the test chart
4.8 Cotton Wool or Cloth Technique

Strips of cotton wool of cloth are soaked in the solution and then placed on the object. A brush may be used to stipple the cotton wool or cloth on the metal to ensure close contact with the metal. The application is left for a period of time and then removed the cotton wool or cloth while is still moist to avoid the fibers bonding to the metal. (Hughes 2001, 41.)

Unpleasant results may appear when fibers are bound to the metal even when the cotton is taken while still moist.

Cotton wool patina sample 41 from the test chart

4.9 Shaved Plane Wood Technique

I developed this technique from the sawdust and cloth technique. A long strip of shaved wood is dipped in the chemical solution then wrapped tightly to the metal and left in a closed container for a few days. Although the technique is similar to previous techniques, the results of patterns and textures are quite different and delightful. Other material may be used for patination; however, take in to account that not all chemical can be mixed with organic materials.

Shaved wood patina sample 44 from the test chart
### 4.10 Finishing

When coloring is completed and all objects are dried, the surfaces will need to be sealed in order to prevent fading colors. Sealing patination can be achieved by applying wax, lacquer, or varnish. However, it is important to give sufficient time for the patinated object to dry. If the patina is not completely dried and sealed, the moisture trapped in the piece may ruin the overlook of the patination which is hard to repair and all work may need to start over. (Hughes 2001, 45.)

### 4.11 Safety

Most chemicals used in patinations are toxic, corrosive, or harmful in many ways. Although information relating to the more harmful chemicals are stated in the recipes, it is wise to always keep the area ventilated, wear chemical resistant goggles, a chemical respirator, an apron, and heavy duty chemical gloves when working with patina solutions. Moreover, chemical labels should always be read prior to usage. If there is any risen doubt about any chemical or mixture, information can be found through websites such as REACH or ECHA which contain the European regulations on chemicals.

A general safeguard in patination is to work in a clean and sealed place. The workplace for patination must have a ventilation system and enough space for all the activities that need to be performed during coloring. First aids and fire extinguishers should be in the room in case of any accident. (Hughes 2001, 333.)
Two recipe books have been created within the course of this thesis, each with forty-four recipes tested on different materials: copper, brass, sterling silver, nickel silver, and silver plated copper. All recipes have been tested twofold to make sure the patina produced on the metal did not happen by a coincidence of the amount of chemicals mixed, contamination, or temperature difference. And the results of the two recipe books were pleasingly identical.
I am very fond of nature, when I walk in the forest or when I travel abroad I tend to collect interesting objects I find along the way. I collect anything from interestingly shaped branches to peculiar unknown fruit or flowers. And from time to time, I will take the objects out, examine them carefully and try to design some jewelry of them. Over the years, my collection box became bigger and bigger. For this final work, I took a few selected items out of said box and used it as a source of inspiration.
6.1.1 The Transformation of Organic Shapes to Metal – Casting

For further studies of the organic objects I decided to cast some of them in metal in order to better see the structure and feeling of it.

Lost wax casting is the most widely used technique by jewelers and manufacturers to produce intricate shapes or duplicate a form. In this technique, a model is made of wax or other combustible material and placed in a flask. A plaster material is poured into the flask, let dry, and then placed inside a kiln to burn out the wax model. Metal like silver or bronze is then heated to a melting point, then poured into the empty mold and cast as the model shape. (Mccreight 1986, 1.)

6.1.2 The Chosen Initial Object

When this object was cast, an accident happened during the process causing one of the casts in an incomplete form. Being a jeweler for many years trained me to embrace an accident when it happens and use the incident to create spontaneous jewelry. Therefore, when this object came out in an unexpected butterfly form, I was thrilled to use it in my design.
6.2 Complex Design Sketches

After scrutinizing the cast form, I came to a decision of using the form as it is for the complex jewelry.
6.3 Simplified Design Sketches

Simplicity is not just the inexistence of clutter, to achieve simplicity one has to go very deep to understand the fundamental in order to get rid of the parts that are unessential. (Isaacson 2011, 343)
I designed the form into earrings, necklaces, brooches, and rings. However, my goal for the jewelry set other than patination is to show the process from a complex to a simple form. After thoroughly considering each design, I settled for three necklaces. The reason I preferred necklaces over other forms is that they are greater and emphasize the patination and transformation progress in greater detail.
7 From Sketches to Metals

7.1 The Simple Form – Serial Jewelry

“Simplicity is about subtracting the obvious, and adding the meaningful.”

- John Maeda
After simplifying the cast butterfly, I tended toward the drop shape design for its difference, unlike a common butterfly shape. However, considering the other two necklaces, the drop shaped butterfly appears disconnected to the cast butterfly, it breaks the similarity in between them. That is why I came to the decision of using the outlined butterfly necklace to link the simplified version to the unique jewelry.

7.1.1 Study of Butterfly Outlines

Butterfly outline drawn out of cast model
7.1.2 Sawig Out the Form from Silver Sheet

The reason for producing the outline in a one-dimensional form is to give a complex form an effect of simplicity. In addition, a plane form is more desirable to create molds for serial manufacturing as it is much easier to process.

To keep it simple, I first planned to use only the butterfly outline as a necklace. After sawing the form out and placing it on the model to get an impression of it, I sensed the form was too flat. To add a little dimension but still keeping it simple and easy for serial production, I added another small but full butterfly on the jewelry to rise contrast and add an interesting side.

7.1.3 Composition Arrangement

Placing the two butterflies on the model in different direction and angles, in order to find the best way to blend the objects and create an interesting formation.
7.1.4 Patina Color Study in Photoshop

Using Photoshop, I placed pictures of the tested patina on the jewelry area where I wished to apply colors. Using this method allowed choosing the best suited patina for the jewelry as the true color of patina on the object can easily be seen and changed without problems.

Since this necklace is intended to be worn as an everyday jewelry, I chose to use only silver for the reason that it does not stain human skin like copper or brass does. However, a downside about using silver is that the patina often is not very colorful. Out of the forty-four patina recipes, only six are suitable for this piece.

Blue torch patina was chosen because it expresses a natural atmosphere.
Model aimed at presenting a contrast between form and surface, using a rough and intricate butterfly form with the combination of a wide and polished surface collar.
Having decided to use the butterfly form as it is, I began to duplicate and experiment on the form. I made various wax forms and modified them slightly to fit my criteria for each necklace.

For the unique necklace, I decided to cast the butterflies in bronze and patinate them afterward. I chose bronze as base material because it allows for a wide range of patina colors. However, bronze is a metal that consists of copper, tin, and zinc alloys, which means it tarnishes easily and turns the skin green if worn for a longer period. Being aware of this fact, in order to protect the clothes and skin coloring from the patina and bronze I soldered silver wire on the butterfly form to cold connect it to the necklace; this way there would not be any direct contact of clothes or skin with the patina or bronze.
7.2.2 Patina Color Study in Photoshop

A copper patina test piece was used for the Photoshop study; however, the base material of the butterfly is bronze. Therefore, a slight color difference happened due to the different base material, since I was not able to use bronze for the test pieces. Nevertheless, due to bronze containing big amounts of copper alloy and from previous own experience, I was confident the colors will turn out quite similar as in the study.
7.2.3 Composition Arrangement
7.3 The Complex – Art Jewelry

Butterfly wax form placed around a model to visualize how the form flows on the neck.
7.3.1 Investigating Other Metal Forming Methods – Electroforming

The original idea for the first necklace was to cast each butterfly into silver, patinate one butterfly, and then connect all of them. However, each cast butterfly weighs approximately fifteen grams; to form a complete necklace about thirty butterflies are needed. Thus, the quest of reducing weight and costs gave rise to another method: electroforming.

Electroforming is a technique for forming a metal part by electrocoating in a plating bath over a base form which is subsequently removed or left in it. (GAR 2009, 2.) In other words, a base form is coated slowly with particles that are emitted from a piece of metal, when both are placed in an electroelectrically conducting bath and are energized with opposite poles. There are two types of base forms; one is a permanent form, such as metal which stays inside the coated metal skin, and the other one is of a disposable material like wax, which melts away after the metal particles formed a skin around it. The metal coating in electroforming can be as thick as the maker wishes, so the hollow form can support itself. Experiments on electroforming have soon begun after learning the technique. The outcome of the electroformed butterflies varied from the cast butterflies. Besides the weight difference, the surface was also different. In the casting technique, the object surface comes out exactly as the surface of the model. On the other hand, the surface of an electroformed object is characteristically granulated because it is made up of a large number of once freely floating particles.

Analyzing the electroformed butterflies, I was convinced that the granulated surface, that the electroforming brings to the form, has a positive effect for the necklace I designed. As a result, it gives a more elegant touch to the designed form. Consecutively, further testing on electroforming began. First trials failed because of the thickness, since electroforming is a technique where the metal coats around the base form; hence, it adds a few millimeters thickness to the original form. Although it is only a few millimeters thicker; nevertheless, it entirely brings down the elegance impression of the design.

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Having the mind set on the half electroformed butterfly, I began to prepare a batch of electroforming process. The first step was to connect the wax forms with a metal wire so the electric current could pass through all the wax forms.

At this time, the interval seminar to present the design and working process was held. During the presentation I received some feedback stating that in nature, butterflies fly more unstructured like the above picture and not so organized like my designed necklace.

Given that I too have thought of the same way previously, I took the comment into attention.

7.3.2 Research of Butterfly Movements

Researching on butterfly images, I recalled the reason I have always liked butterflies: For their freedom and fragile nature. Therefore, I began to consider new possibilities.

The reason I hesitated earlier about the freer design was because I was too concerned about the idea of no strings attached. I sought methods for making free butterfly jewelry or at least attached only with very thin materials.

Considering all possibilities of design and wearabilities, I came to the conclusion that free butterflies are impossible as a necklace, and too thin materials as connections are not going to last long. In order to still make this idea work, a little more thickness was needed for the connecting material. Consequently, I began to experiment with a thicker material.

After trying the free form necklace with one millimeter wire, I was pleased to find that the thickness of the wire is not as bothersome as I imagined. Therefore, I have come to the decision of changing the design from the original version.

Being a jeweler for years has prepared me for last minute idea changes. If it is for a better design I am always willing to modify the idea as long as time allows it. In addition, since this necklace is meant to be art jewelry, the latter design is more suitable. On top of all, since the latter design uses a one millimeter wire and many butterflies on top, the butterflies must not be too heavy; therefore, the previous research and work on electroforming comes in absolutely handy for this design.
Forming the necklace using the previously electroformed butterflies with one millimeter wire.

The idea behind this necklace is to radiate an atmosphere of fantasy, to be colorful and delightful. Therefore, I patinated all the butterflies on it in different colors.

After numerous tests and experiments, I finally achieved the colors as displayed in the picture on 999 pure silver.

Patina application used: immersion technique and torch technique.
I decided to use wire and two pins as locks mechanisms, which gives more flexibility on the wearing system. As a result, the wearer can change the arrangement in different ways as desired, letting the butterflies orbit randomly.
8 The Produced Jewelry

8.1 Serial Jewelry

An everyday jewelry to be worn on any occasion, which expresses simple delight.
8.2 Unique Jewelry

Expresses the desire for attention and specialty, gives the wearer a feeling of uniqueness and reflects their pride.
8.3 Art Jewelry

Radiates a magical atmosphere that reminds of a fairy tale.
In this thesis two subjects were explored with respect to the jewelry domain. Firstly, patinas (colorful tarnish surfaces on metal) were researched and an illustrated recipe book was created. Secondly, the art of minimalism was applied designing a set of necklaces containing complex and simple shapes. Finally, patina was applied in a meaningful way to the pieces in the set, in order to bridge the gap between both parts of the thesis.

In conclusion, by having explored two subjects I accomplished the goal I set to myself. Satisfaction is not to be mentioned; however, as an imperfect human being, a fly in the ointment is always sensed.

Enthusiasm about obtaining colorful patinas and consideration about chemical ingredients were not taken into account while choosing the patina recipes. After the patina experiments were conducted and I gathered enough knowledge about the chemicals and their dangers, I realized that several recipes I used will be difficult to produce on my own outside the university. For one reason, extremely hazardous chemicals are not for sale to individuals. In addition, an isolated area for patination may not be provided in common workshops; thus, I believe more patina tests should be carried out considering the chemical ingredients in the future.

From this study I experienced that patina can be applied virtually on any shape or surface. However, some techniques work better on certain surfaces or forms, for example special techniques of application, such as sawdust, work better on plane surfaces since the patina itself gives a strong texture. On intricate shapes, the immersion technique is more suitable as the liquid reaches evenly on all parts of an uneven surface.

For the second part, the process of simplifying complex forms resulted in two things: a simple form for commercial jewelry, and a complex form for a unique jewelry. Analyzing the three produced necklaces led me to discover the different impressions. Both, the art necklace and the unique necklace display charm and style, they expose a strong character and call for attention. On the contrary, the simplified necklace does not stand out too much, but its presence can be sensed when it is around. The exploration of simplification gave rise to many different possibilities. However, I am not fully satisfied with the simple version due to its lack of character. Nevertheless, the final form was chosen in order to fit all three necklaces into one category.

Throughout this thesis, I was able to verify and validate my design qualities. My style is simply not simple and there is no harm in it. Simplicity is important, but I am not dedicated to too much of it: A little character is always needed in my design. As an example, the unique necklace I created was a combination of a simple neck collar with intricate butterflies, the necklace is simple but at the same time complex. However, if needed I am able to create simpler jewelry for more commercial purpose. As for my true identity, it is my passion and devotion toward creating beautiful one-of-a-kind jewelry that touches the viewers’ heart.

In quest of naming the work, I thought about the evolution of forms, and how each butterfly once turned from a caterpillar into a beautiful, colorful, and graceful creature. I decided to name my jewelry *metamorphosis*, which implies the change of colors and forms of my work.
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Chemical Safety

According to the European regulation on chemicals and their safe use, REACH, chemicals that were produced and labeled before September 1981 were called “existing” chemicals. Chemicals produced after 1981 were called “new” chemicals. The difference between the “existing” and “new” chemicals is that the new chemicals have been tested before they were placed on the market. On the other hand, there were no such provisions for the “existing” chemicals; in addition, there is insufficient information about the health hazards on the “existing” chemicals. (Environment Directorate General 2007, 3)

While working with the patination in the jewelry studio, most of the chemicals provided were the “existing” chemicals; therefore attention must be taken. Some chemicals can cause severe damage such as cancer or some defects in the organ systems. If there is any doubt about any chemical, classification can be made through REACH or other chemical laboratory.

Below is a listing of some new and old chemical pictograms and its meanings that can be seen in the chemicals labels. (Extracted from European chemicals agency website.)

**Oxidizing**
- **What does it mean?**
  - May cause or intensify fire; oxidiser.
  - May cause fire or explosion; strong oxidiser.
- **Examples of where we can find it**
  - Bleach, oxygen for medical purposes
  - Examples of precautionary statements
  - Keep away from heat/sparks/open flames/hot surfaces. — No smoking
- **Symbols that will be phased out:**
  - Keep container tightly closed
  - Protect from sunlight
  - Symbols that will be phased out:

**Flammable**
- **What does it mean?**
  - Extremely flammable gas or aerosol.
  - Highly flammable liquid, vapour, or soil
- **Examples of precautionary statements**
  - Do not spray on an open flame or other ignition source.
  - Keep away from heat/sparks/open flames/hot surfaces — No smoking
- **Symbols that will be phased out:**
  - Drain cleaners, acetic acid, hydrochloric acid, ammoniac

**Corrosive**
- **What does it mean?**
  - May be corrosive to metals
  - Causes severe skin burns and eye damage
- **Examples of where we can find it**
  - Lamp oil, petrol, nail polish remover
  - Health Hazard
  - May cause respiratory irritation, drowsiness or dizziness, allergic skin reaction, eye irritation.
  - Wash thoroughly after handling
  - Wear protective gloves/protective clothing/eye protection/face protection
  - Shower:
    - Do not breathe dust/fume/gas/mist/vapors/spray
    - Wash thoroughly after handling
    - Wear protective gloves/protective clothing/eye protection/face protection
  - Store locked up:
    - Keep only in original container
    - Symbols that will be phased out:
Acute Toxicity

- What does it mean?
  Fatal and toxic if in contact with skin, if swallowed or inhaled

- Examples of precautionary statements
  Avoid breathing dust/fume/gas/mist/vapor/spray
  Use only outdoors or in a well-ventilated area
  If inhaled: remove victim to fresh air and keep at rest in a position comfortable for breathing
  If swallowed: call a poison center or a doctor/physician if you feel unwell
  Wear protective gloves/protective clothing/eye protection/face protection
  If on skin: wash with plenty of soap and water
  If in eyes: rinse cautiously with water for several minutes. Remove contact lens if present and easy to do. Continue rinsing.

- Symbols that will be phased out:
  Do not eat, drink or smoke when using this product.
  If swallowed: immediately call a poison center or a doctor/physician
  Rinse mouth
  Store in a closed container
  Do not get in eyes, on skin, or on clothing.
  Wear protective gloves/protective clothing/eye protection/face protection.
  If on skin: gently wash with plenty of soap and water
  Remove/take off immediately all contaminated clothing.
  Wash contaminated clothing before reuse.
  Do not breathe dust/fume/gas/mist/vapor/spray.
  Use only outdoors or in a well-ventilated area
  Wear respiratory protection
  If inhaled: Remove victim to fresh air and keep at rest in a position comfortable for breathing
  Store locked up
  Symbols that will be phased out:

 Serious Health Hazard

- What does it mean?
  May be fatal if swallowed and enters airways
  Causes damage to organs

- Examples of where we can find it?
  Turpentine, petrol, lamp oil

- Examples of precautionary statements
  If swallowed: immediately call a poison center or a doctor/physician
  Do not induce vomiting
  Store locked up
  Do not breathe dust/fume/gas/mist/vapors/spray.
  Wash thoroughly after handling.
  Do not eat, drink or smoke when using this product.
  Get medical advice/attention if you feel unwell
  Obtain special instructions before use
  Do not handle until all safety precautions have been read and understood
  Symbols that will be phased out:

Chemical Waste Disposal

Chemical waste should never be rinsed down the sink or simply thrown in the trash can as it may contaminate the environment.

All chemical waste should be poured in a safe container with a clear label of the content for the chemical waste department to dispose.
Possible Simple Forms

Since the cast form is rather intricate, a simplification is needed for the simpler jewelry. To begin with, I used cut out papers to explore some possible form simplifying the cast butterfly.

Dress Making for Photo Shooting

Using a green fabric, I tried to make a fairy-like dress that emphasizes the jewelry and the idea of fairy tale.