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**Materials**

�**Reagents**

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| Soybean oil refined, bleached, deodorized | Sesame seed oil |
| Vitamin A tablets | Iron sulfate tablets |
| Vitamin C tablets | Sodium Thiosulfate 0.01N (Na2S2O3) |
| Vitamin E capsules | Starch indicator solution (1%) |
| Ginger | Saturated potassium iodide solution (KI) |
| Garlic | Glacial acetic acid-dodecane 3:2 |
| Green tea extract | Deionized water |
| Finely powdered rosemary | � |

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**Apparatus**

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| 30 glass jars (1-ounce, widemouth, with screw caps) | Gloves |
| Electronic balance | Beakers |
| Labels or Grease Pencil | Pipettes |
| Oven, thermostatically controlled at 62.8oC + 2.8oC | Burette |
| Aprons | Ring stand |
| Goggles | Erlenmeyer flasks |
| Graduated cylinders 50 ml. | � |

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**Procedure**

Initial Procedure

1. WARNING! Always observe good laboratory safety techniques. Wear lab apron, goggles, and gloves. Make sure all materials are easily accessible.
2. Place one glass jar on the balance. Tare the balance.
3. Measure 10.0 g of soybean oil into the jar.
4. Tare the balance and add 0.01 g (concentration 1) of natural antioxidant to the jar.
5. Cap the jar, shake vigorously, and label (e.g. A1, for antioxidant A, concentration 1).
6. Repeat steps 1-4 until half of the total jars have received concentration 1 of all of the antioxidants.
7. Repeat steps 1-4, adding 0.05 g (concentration 2) of antioxidant to each jar instead of 0.01 g (see step 3) until the remaining half of the jars has received concentration 2 of all the antioxidants.
8. Check all jars for labels.
9. Open jars one by one, and record what you smell in a data table under t=0. (t= time in days) Assign the odors a numerical value (which you will record) on a rubric of 0 (no odor) to 4 (highly offensive odor).
10. Re-cap all jars tightly.
11. Place all jars in an upright position into an oven maintained at a constant 65� C.

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Daily Procedure

1. Everyday in the morning and afternoon (at approximately the same times each day), uncap all jars for about 1 minute to allow for circulation of fresh air.
2. Smell each jar each day (at approximately the same time each day), and record the numerical value in a data table under t=1, t=2, t=3, etc.
3. After several samples reaches 4, end experimentation and graph results. However, keep oil in jars and aerate every day in preparation for peroxide value (PV) titration test.

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Preparing Reagents for Peroxide Value Test

1. Acetic acid-dodecane solution

1. Mix 3 parts by volume of reagent grade Glacial acetic acid with 2 parts by volume of USP grade dodecane.

2. Potassium iodide, KI, saturated solution

1. Add 140-150 g of reagent grade Potassium iodide to 100 ml. of freshly boiled Deionized water. Stir until most of the material dissolves. Saturation of the solution is indicated by the presence of undissolved crystals.
2. Store in a dark place.

3. 0.01N Sodium Thiosulfate

1. Dissolve 2.5 g +/- 0.01 g of sodium thiosulfate in 1 L of deionized/distilled water.

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Peroxide Value Test

1. Weigh approximately 5.00 of sample into a 250 ml. Erlenmeyer flask and add 30 ml. of the acetic acid-dodecane solution. Swirl until the sample is dissolved and add 0.5 ml. of the saturated potassium iodide solution.
2. Allow the solution to stand with occasional shaking for exactly one minute, and then add 30 ml. of distilled water.
3. Titrate with 0.01N sodium thiosulfate adding it gradually and with constant and vigorous shaking. Continue the titration until the yellow color has almost disappeared, and add 1 ml. of starch indicator solution. Continue the titration until the blue color has just disappeared.
4. The blank titration is conducted by the same procedure as described in steps 1 to 3, but no sample is used. The blank must not exceed 0.1 ml. of 0.01N Sodium thiosulfate.

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Calculation of Peroxide Value

�Titration (ml used) - Blank Titration] x Normality x 1000 = PV in milliequivalents/1000

Weight of Sample

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