

## Standard and Specification > Natural Additives > Red Cabbage Color

Red Cabbage Color	
<b>Definition</b>	Red Cabbage Color is a pigment obtained by extracting red cabbage leaves ( <i>Brassica oleracea</i> L. var. <i>capitata</i> DC. Etc.) with water. The major component is anthocyanin. Dilutant, stabilizer, or solvent can be added for the purpose of color value adjustment and quality preservation.
<b>[Compositional Specifications of Red Cabbage Color]</b>	
<b>Content</b>	Color value (E 10%, 1cm) of Red Cabbage Color should be higher than the indicated value.
<b>Description</b>	Red Cabbage Color is deep red liquid, powder, or paste with a slight characteristic scent.
<b>Identification</b>	<p>(1) The Test Solution in Color Value section shows red color and a maximum absorption band near 536 nm.</p> <p>(2) When Test Solution in (1) is alkalinized by adding sodium hydroxide solution, it becomes deep green.</p>
<b>Purity</b>	<p>(1) Arsenic : 0.25 g of Red Cabbage Color is placed in a platinum, quartz, or porcelain crucible. 10 ml of magnesium nitrate in ethyl alcohol (1→50) is added to the crucible and then alcohol is ignited. It is then reduced to ash by heating at 450~550°. If carbonaceous substance persists, it is wetted with minute amount of nitric acid, which is further heat treated at 450~550°. After cooling, 3 ml of hydrochloric acid is added to the residue, which is then dissolved by heating in a water bath. When test for arsenic is carried out with this test solution, it should not be more than 4ppm.</p> <p>(2) Heavy Metals : 1 g of Red Cabbage Color is carbonized by heating mildly in a quartz or porcelain crucible. After cooling, add 2 ml of nitric acid and 5 drops of sulfuric acid, it is heated until white smoke disappears, which is then reduced to ash by further heating at 450~550°. After cooling, 2 ml of hydrochloric acid is added, which is then evaporated to dryness in a water bath. 3 drops of hydrochloric acid and 10 ml of hot water are added to the resulting residue, which is then heated for 2 minutes. After cooling, 1 drop of phenolphthalein indicator solution is added, then ammonia solution is added until the color of the solution becomes pale red. The resulting solution is transferred into a Nestler cylinder by rinsing with water. 50 ml of test solution is prepared by adding 2 ml of dilute acetic acid (1→20) and water. When this solution tested for heavy metals, the content should not be more than 20ppm. Color standard solution is prepared by the following procedure. 2 ml of nitric acid, 5 drops of sulfuric acid, and 2 ml of hydrochloric acid are added and evaporated to dryness in a crucible that is made of the same material used for test solution preparation. 3 drops of hydrochloric acid are added to the residue, which is then transferred into another Nestler cylinder as described above. Finally, 2 ml of lead standard solution, 2ml of diluted acetic acid (1→20), and water are added to bring the total volume to 50 ml.</p>
<b>Assay(Color Value)</b>	<p>Appropriate amount of Red Cabbage Color is precisely weighed so that the absorption is within 0.3 ~ 0.7 and dissolved citric acid · dibasic sodium phosphate buffer solution with pH 3.0 so that the total volume is 100 ml (Test Solution). If necessary, the solution is centrifuged and the supernatant is used. Using citric acid · dibasic sodium phosphate buffer solution with pH 3.0 as a reference solution, absorption A is measured at 536 nm wavelength with 1cm path length. Color value is obtained using the following equation.</p> $\text{Color Value(E 10\%, 1cm)} = \frac{A \times 10}{\text{Weight of sample(g)}}$ <p>Citric acid-dibasic sodium phosphate buffer solution (pH 3.0)            Solution 1 : 0.1M citric acid solution : 1 L of solution containing 21.01g of citric acid (C<sub>6</sub>H<sub>8</sub>O<sub>7</sub>·H<sub>2</sub>O).            Solution 2 : 0.2M dibasic sodium phosphate solution : 1 L of solution containing 71.63 g of dibasic sodium phosphate (Na<sub>2</sub>HPO<sub>4</sub>·12H<sub>2</sub>O).</p>

	Solution 1 and Solution 2 are mixed well (159:41) and its pH is adjusted to 3.0.
<b>Permitted Use Level of Red Cabbage Color</b>	<p>Should not be used for the food items listed below.</p> <ol style="list-style-type: none"><li>1. Natural food [meat, seafood (whale meat included), vegetables, fruits, marine algae, bean, and their simply processed food (peeled or cut)]</li><li>2. Tea</li><li>3. Hot pepper powder, red pepper powder or shredded red pepper</li><li>4. Kimchi</li><li>5. Fermented hot pepper soybean paste</li><li>6. Vinegar</li></ol>