

Read the article and fill the gaps with appropriate words.

DECAFFEINATION

Adapted from <http://en.wikipedia.org/wiki/Decaffeination>

concentrations referred caffeine removing unroasted
chemicals mass rinsed

Decaffeination is the act of 1. caffeine from coffee beans, cocoa, tea leaves and other caffeine-containing materials. (While caffeine-free soft drinks are occasionally 2. to as "decaffeinated", some are better termed "uncaffeinated": prepared without adding caffeine during production.) Despite removal of caffeine, many decaffeinated drinks still have around 1-2% of the original 3. remaining in them.

In the case of coffee, various methods can be used. The process is usually performed on 4. (green) beans, and starts with steaming of the beans. They are then 5. with a solvent that extracts the caffeine while leaving the other essential 6. in the coffee beans. The process is repeated anywhere from 8 to 12 times until it meets either the international standard of having removed 97% of the caffeine in the beans or the EU standard of having the beans 99.9% caffeine-free by 7. Coffee contains over 400 chemicals important to the taste and aroma of the final drink: it is therefore challenging to remove only caffeine while leaving the other chemicals at their original 8.

Swiss Water Process

traps discarded released retain diffuses soaked captures

The Swiss Water Process is a method of decaffeinating coffee beans developed by the Swiss Water Decaffeinated Coffee Company. To decaffeinate the coffee bean by the Swiss Water method, a batch of green (unroasted) beans is 1. in hot water, releasing caffeine. When all the caffeine and coffee solids are 2. into the water, the beans are 3. The water then passes through a carbon filter that 4. caffeine but lets the coffee solids pass through. The resulting solution, called "green coffee extract (GCE)" by the company, is now available for decaffeinating coffee. New green coffee beans are introduced to the GCE. Since the GCE is coffee solids without

caffeine only the caffeine 5. from the new beans. The GCE passes through proprietary carbon which 6. the caffeine. The process repeats, filtering out all the caffeine until the beans are 99.9% caffeine-free. These beans are removed and dried, and thus 7. most if not all of their flavor.

Direct method

synthetic gathering acetate drained steamed residual

In the direct method, the coffee beans are first 1. for 30 minutes and then repeatedly rinsed with either dichloromethane or ethyl 2. for about 10 hours. The solvent is then 3. away and the beans steamed for an additional 10 hours to remove 4. solvent. Sometimes coffees that are decaffeinated using ethyl acetate are referred to as naturally processed because ethyl acetate can be derived from various fruits or vegetables; but, because of the impracticality of 5. natural ethyl acetate, the chemical used for decaffeination is 6.

CO₂ process

reduced transition evaporate charcoal harmful extraction
supercritical diffusivity compressed

This process is technically known as supercritical fluid 1. In the carbon dioxide method, the caffeine is stripped directly from the beans by a highly 2. semi-liquid form of carbon dioxide. Pre-steamed beans are soaked in a bath of 3. carbon dioxide at a pressure of 73 to 300 atmospheres. After a thorough soaking for around ten hours, the pressure is 4. , allowing the CO₂ to 5., or the pressurized CO₂ is run through either water or 6. filters to remove the caffeine. The carbon dioxide is then used on another batch of beans. This liquid works better than water because it is kept in supercritical state near the 7. from liquid to gas, combining favorable 8. properties of the gas with increased density of a liquid. This process has the advantage that it avoids the use of potentially 9. substances.

Triglyceride process

method flavor surface dried batch immersed

Green coffee beans are soaked in a hot water/coffee solution to draw the caffeine to the **1.** of the beans. Next, the beans are transferred to another container and **2.** in coffee oils that were obtained from spent coffee grounds.

After several hours of high temperatures, the triglycerides in the oils remove the caffeine—but not the **3.** elements—from the beans. The beans are separated from the oils and **4.** The caffeine is removed from the oils, which are reused to decaffeinate another **5.** of beans. This is a direct-contact **6.** of decaffeination.