

# ODOR NULLIFYING AGENTS – TOILET ROOM FRESHENER BLOCKS AND MOTHBALLS

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### Introduction

We all have seen the TV commercials where in a woman badmouths her neighbor/colleague as the woman's imitator but without a classy style. The advertisement also informs us to her invitation to her associates house and the woman's spontaneous visit to the bathroom having no agents to nullify odor or toilet freshener block and so indicating her neighbor as having no civic sense or decent manners. Does this not directly mean consumers not using this specific brand are all uncivilized having no decent manners? Consumer may well think twice about this before encouraging or endorsing products of such marketers. In another commercial we see a mother sniffing and walking into a teenager's room, telling him that 'nice' girls will never want him because his room smells like that of a teenage boy. She tells it is time to 'wash' his room, handing him a bottle, which he proceeds to spray on every surface, including his pillow and bed. In the next scene, a girl walks in, sniffs around and decides the boy is the right one for her. Yet another company describes its product as, freshener made of pure Para dichlorobenzene crystals and quality fragrance pressed to a block with a hanger built right in. On unwrapping the foil wrapper, the 'freshener' begins to evaporate, releasing a clean fresh scent of Lime fresh, Lavender, Rose, Jasmine, Sandal, etc. These commercials are all so wrong, that we can argue on its intrinsic worth for hours together. However, the focus of this paper is not to discuss on incorrect and false advertisements but on a more serious topic that detail on the long-term health ill effects on regularly using these products.

Air fresheners are available in different forms, from air and fabric sprays, to plug in burners, to solid dispensers. Apart from perfuming the air of our homes, it also wreaks havoc on the house's air quality. If we are suffering from frequent headaches, allergies, chronic pain and discomfort of one kind or another and dependent on some form of daily medication, the various symptoms could simply be a reaction to the chemicals that are present in our house. It may be true that most urban families are too busy to clean their houses constantly, however what is that in our homes which smells so bad that a continuous stream of artificial scent has to permeate every corner for 24 hours a day? Frankly speaking, there is nothing! It is only the TV commercials and advertisements we see in magazines, that slowly, over time, leads us to believe that our house smells of this repulsive odor, a cross between a rotting garbage pile and a fish market that we must mask at all costs. Truthfully, nobody's house smells that bad and use of such artificial air fresheners every day is one sure way to kills us slowly and steadily.

### What is in an Air Freshener?

Most toilet room fresheners' blocks or mothballs and room air fresheners are pesticides dispensers. We define a mothball as, 'Small balls of chemical pesticide and deodorant used when storing clothing and other articles that are susceptible to damage from mold or moth larvae.' They contain either naphthalene or para dichlorobenzene (p-DCB) as an active ingredient. Both of these chemicals are toxic fumigants (which mean they volatilize into the air) and must be present in high concentrations to be effective as a pest control product. Incidentally, they can also be dangerous to humans. In fact, we can detect the odor of mothballs at a few parts per billion in the air and seriously impairing indoor air quality. Some other air freshener in addition may also contain ingredients, like petroleum distillates, aerosol propellants, etc. Petrochemical distillate contributes to air, soil and groundwater pollution and effects human health with respiratory problems, asthma, chemical pneumonia and pulmonary damage. Aerosol propellants apart from harming earth's atmosphere can also

damage human health, by increasing cancer risk, breathing problems and development of chronic health issues. p-DCB may cause anemia, liver damage, loss of appetite, changes to the blood, skin lesions, etc. Air fresheners also contain synthetic aroma chemicals or fragrances often in form of an aromatic blend.

### Indoor Air Quality

Ironically, room air fresheners designed to 'improve' indoor air quality by making it smell better actually ends up making our home more 'toxic'. Various studies show that regular use of air fresheners in our homes can trigger asthma, allergies and other breathing problems. Our homes are all relatively closed spaces. When we add elements that diminish air quality it can only do harm by contributing to the toxic chemicals brew, in our trapped Ariel system. Air fresheners are dangerous for persons suffering from pulmonary diseases like asthma, allergies or COPD (Chronic Obstructive Pulmonary Disease) and may harm pets, which have faster metabolism rates in comparison to humans.

### Why do Air Fresheners 'smell good'?

Air fresheners do not actually make the smell go away from our homes. It instead only changes the way our nose perceives them by coating our nostrils with a thin film and by making the nerve cells in our nose dead.

### Naphthalene

Naphthalene is a hydrocarbon derived from coal tar, which easily exudes gas, and acts as a fumigant. Naphthalene is soluble in oils and fats evaporating easily and emitting a strong odor that repels moths. Humans can detect it in the air at concentrations of 84 ppb and inhale, ingest or absorb it transdermally. Naphthalene can cause headaches, restlessness, lethargy, vomiting, anorexia, methemoglobinemia, hyperkalemia, anemia, hemolysis, fever, acute renal failure, seizures, tremors and coma. When we burn things, it produces naphthalene. Cigarette smoke, car exhaust, smoke from forest fires, etc., all have naphthalene. Naphthalene breaks down in our body to alpha-naphthol, leading to the development of hemolytic anemia, the abnormal breakdown of red blood cells, resulting in improper transport of oxygen to various organs in the human body. Kidney and liver damage may also occur during excretion of alpha-naphthol and other metabolites through urine.

### 1, 4-dichlorobenzene (p-DCB)

1, 4-Dichlorobenzene or para-DCB or p-DCB or para crystals are chemicals used to control moths, molds, mildew, to deodorize, toilets (bathroom & urinals), waste containers, etc. At room temperature, p-DCB is a white solid with a strong, pungent odor. On exposure to air, it slowly changes from a solid to a vapor that acts as a deodorizer or insect killer. People can smell p-DCB in the air at low levels and easily recognize the odor as the smell of mothballs. Most of the p-DCB in our environment is due to the use of moth repellent products and toilet deodorizer blocks. On entering the environment, it breaks down to harmless products but only after about a month. It does not easily dissolve in water or break down by the action of soil organisms but evaporate easily from water and soil, to air. However, plants and fish can take up p-DCB and retain them in their bodies.

### Odor Nullifying Agents & Human Health

Human exposure generally comes from breathing indoor air in public restrooms and homes that use p-DCB as a deodorizer.

Workplace air during p-DCB manufacture, drinking contaminated water, eating p-DCB contaminated foods like meat, chicken and eggs, due to its use as an odor control agent in animal stalls and fish from polluted waters. Even though there is no direct evidence that moderate, use of household products containing p-DCB results in harmful effects to health, higher exposures and prolonged usage can surely result in dizziness, headaches and liver problems. There are reports of painful irritation of the nose and eyes, skin blotches and lower the numbers of red blood cells in cases of high exposure of p-DCB. Animals given high levels of p-DCB in water developed liver and kidney tumors. One study even finds the presence of p-DCB in breast milk. Medical tests available to determine exposure to p-DCB measures a breakdown product of p-DCB called 2, 5-dichlorophenol in urine and blood, that indicates if the person was exposed to p-DCB within one or two days. Center for Disease Control (USA) classifies p-DCB as a 'possible occupational carcinogen'. US National Toxicology Program says that p-DCB possibly causes reproductive damage. Reports claiming that, p-DCB cause asthma, allergy attacks, liver disease, kidney malfunction, gastrointestinal problems, eye irritation and skin rash also exist. The World Health Organization (WHO) considers Naphthalene and p-DCB as a possible carcinogenic to humans based on studies with rodents (mice).

Although the toxic effects of these two substances are different, The University of Colorado study pinpoints that these chemicals blocks enzymes, which initiate apoptosis, the normal process of 'cell suicide'. Apoptosis is a checking mechanism that ensures the generation of a right amount of cells in the human body. In Alzheimer's disease and Parkinson's disease, too much apoptosis occurs, whereas in cancer and autoimmune disorders, too little apoptosis occurs. Understanding how carcinogenic compounds can trigger tumor growth becomes important as consumers in a big way make use of hazardous chemicals, like naphthalene and p-DCB through commonly found products like toilet block deodorizers, solid and spray air fresheners, mothballs and crystals. Apart from being toxic, both chemicals are a poor choice for storage. Prolonged exposure of p-DCB vapors melts plastics and can affect clothes with plastic buttons or decorations. Mothballs are effective, only when we place it with the clothing in a sealed container for building up vapors that can kill the moths. In a sealed atmosphere, the vapors do not harm people because they are relatively contained. The main exposure occurs when one fills or opens the containers, or when wearing clothes immediately after opening the container (especially a problem for infants). Mixing naphthalene mothballs and p-DCB mothballs is not advisable, as they react together chemically to produce a liquid (rather than sublimating) causing damage to the items we need to preserve. If this happens to our artifact, the position can only be grim. Odors of wet mothballs are even more potent than dry odors as sublimation is more rapid, putting the person at an even more risk. Similarly, garments upon wetting releases the chemicals that had been absorbed inside the fibers and were dormant. In addition to textiles, wooden cabinets, shelves or drawers also have the propensity to absorb these harmful chemicals.

### Inhalant abuse

Medical doctors also say that inhalant abuse is another major public health issue associated with numerous acute and chronic medical problems, damage to the liver, lungs, heart, kidneys, central and peripheral nervous systems, including sudden death. We define inhalants as volatile organic substances that we can legally find in inexpensive easily accessible common household commercial products. A report exists of a rare case of mothball abuse predominantly by inhalation when the patient had acute peripheral neuropathy and chronic renal failure, illustrating that abuse of common household products not usually identified as recreational drugs. Many times linking chemical inhalants to specific medical problems can be difficult because of confounding

variables, as different inhalants contain a variety of compounds producing different toxic effects. Reports even link inhalant abuse to poor school adjustment, high truancy and dropout rates, increased criminal activity and an elevated incidence of psychopathology. Intoxication symptoms of p-DCB inhalation include euphoria, slurred speech, behavioral disinhibition and ataxia. Mothballs are either of naphthalene or of p-DCB. Toilet deodorizers predominantly consist of p-DCB. Differentiation between the two types is a little difficult because they have similar odors and are both crystalline white solids at room temperature.

### Safer Natural Remedies to eliminate Moth Larvae

Cloth moth larvae do not eat synthetic fibers, but feast only on fibers of animal origin such as clothes made of feathers or felt woolen sweaters, coats and blankets. However, to get to dirt stains of animal origin they can gnaw through synthetic fibers.

1. Keeping out the moths is the best way to protect at-risk (animal-fiber) clothing. Firstly, clean all clothing according to the manufacturer's specifications and then place the clean clothing in airtight containers.
2. We can destroy larvae by placing the clothing in the hot dryer or in the sun once or twice a month.
3. Every 3-4 weeks, shake out and brush woolen items before putting them back in the drawer or on the hanger. This is necessary to dislodge remaining eggs and larvae.
4. Moth larvae generally depend on residual human perspiration, for essential vitamins that is missing in pure or pristine wool. Always clean items prior to storage.
5. Freeze infested items in a tightly sealed bag for 48 hours; Thaw at room temperature, and repeat this process a couple of times. After dry cleaning, wash it in hot water, or thoroughly vacuum clean, then dry and store in an airtight sealed container.
6. Although moth larvae damage clothes that contain both synthetic fibers and wool or other animal fibers, they become active only on long-standing stored undisturbed garments. It is important to remember there are no single process procedures available, and only through diligence and regular monitoring can keep off these moths.

### Alternatives to Air Fresheners

Everyone's home can get little stale. To sweeten the environment, healthily the following are some suggestions to try.

1. **Open Windows:** Every home can only benefit from a good airing. On a day with good air quality and a slight breeze, open the windows for a few hours on all sides of the house to create a cross ventilation breeze that gets the air moving.
2. **Simmer Spices:** Simmer spices such as whole cinnamon, cloves and nutmeg in a simmering pot.
3. **Use odor absorbents:** Use a neutral odor absorbent such as a box of baking soda in a stinky area, or sprinkle in smelly spots (garbage can) with a little vinegar and baking soda.
4. Vinegar can remove odors from surfaces. Spray a little on the smelly surface and wipe it out.
5. To eliminate cooking odors in the kitchen, place a shallow bowl of vinegar nearest the scent area.
6. **Use Essential Oils:** Dab a little essential oil on a light bulb or a warmer to scent a room.
7. Putting a little citrus peel down the garbage disposal and turning it on will remove any stink in the drain.
8. Create a potpourri bowl from bulk herbs, flowers and spices.
9. Soak a cotton ball in vanilla essence and place it in a bowl in the room to smell better.
10. **Craft a Pomander:** Take some cloves and stud an orange. Cure it in the oven on low heat for an hour or so. Keep it in a cardboard box and allow it to cool. Dry the orange for about six to seven weeks. Hang it up with a cloth ribbon or place it in a decorative container to fragrance the room.