BAD ACTOR
chemicals

As Featured in the 2010 TOXIE Awards
SECTION I

Bad Actors and California’s Chemical Regulation
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SECTION II

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Lead
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Methyl Iodide
N-Methyl Pyrrolidone (NMP)
Perchlorate
Perchloroethylene (Perc)
Perfluorinated Compound (PFC)
Phthalate
Toluene
Trichloroethylene (TCE)
Triclosan
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Bad Actor Cast
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Chiara Frenzel, Polybrominated Diphenyl Ether (PBDE)
Denise Duffield, Perchlorate
Edward Enriquez, Mercury
Holly Ridings, The Toxies Hostess
Iliana Carter, Phthalate
Joel Ulloa, Hydrofluoric Acid
John Hale, Methyl Iodide
Juan Rodriguez, Lead
Kevin Walsh, Triclosan
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EXECUTIVE SUMMARY

At no time in human history have we been exposed to so many chemicals. There are an estimated 85,000 chemicals in the stream of commerce, and very little is known about most of them. The health effects of almost half the major industrial chemicals have not been studied at all. Of those that have been studied, approximately 1,400 chemicals with known links to cancer, birth defects, reproductive impacts and other health problems are still in use today.

This report highlights 16 bad actor chemicals in widespread use in California. Some of them are “household names” and some are less familiar. What they have in common is that they affect the health of those exposed to them – whether the exposures take place in manufacturing settings, in the home, or in the general environment – and that there are safer alternatives to all these chemicals.

_Chef_ Chemical Week magazin_e defines “bad actor” chemicals as those that consistently behave or react poorly. The chemicals profiled here are formaldehyde, phthalates, toluene, bisphenol-A, lead, polybrominated flame retardants, trichloroethylene, perchlorate, methyl iodide and mercury. Also referenced are hexavalent chromium, hydrofluoric acid, N-methyl pyrrolidone, perfluorinated compounds, perchloroethylene, and triclosan.

Although this report takes a tongue-in-cheek approach, make no mistake about it – these chemicals have deadly serious health impacts on male and female Californians of all ages, socioeconomic class and ethnicity. Childhood cancers have increased 20% since 1975, and autism now is so prevalent that it is diagnosed in one out of every 110 children.

In 2008, California launched the Green Chemistry Initiative, a coordinated, comprehensive strategy for fostering the development of information on the hazards posed by chemicals, ways to reduce exposure to dangerous substances, approaches that encourage cleaner and less polluting industrial processes, and strategies to encourage manufacturers to take greater responsibility for the products they produce. When an effective Green Chemistry program is in place in California, chemicals such as the ones highlighted here will be phased out, because of their toxic qualities, and will be replaced by substances or processes that are just as effective, cost-neutral and safer.

Unfortunately, there is a great deal of uncertainty about whether the Green Chemistry Initiative will be the robust program envisioned by the legislators who voted for it. The timing of this report coincides with the anticipated release, this spring, of a final draft of regulations that will implement the Green Chemistry program. The administrative law process that will put these rules into action provides opportunities to comment on them and to change them if they are insufficient. If it’s up to the people who peddle chemicals, who spend whatever it takes in terms of time and money in Sacramento to preserve the status quo, the regulations will be vague and weak.

Taking a page from the tobacco industry’s playbook, the chemical industry attempts to cast doubt on the legitimate, peer-reviewed research that indicts toxic chemicals, and then pressures the government so that any action be taken with such deliberation that nothing ever happens. It is up to the public to fight back. The more people know about these “bad actors,” the more they will insist that California’s Green Chemistry program be strong enough to phase out these chemicals quickly and replace them with safer products or processes.
WHY BAD ACTORS?

Chemical policy reform is a daunting subject. There are so many chemicals, and so many of them are useful in our daily life. But environmental health advocates need a tangible way to educate the public about the current system, which requires so little of chemical manufacturers. While there are safety requirements for chemicals in food or drugs, there are no safety requirements for the thousands of chemicals that comprise the vast majority of the products we use every day. Thus, when concerns arise that a chemical is causing cancer or birth defects, we have to struggle to get it off the market. “Innocent until proven guilty” is appropriate in the criminal justice system, but not when it comes to chemicals that harming our children, our workers, our water and our air.

Bad actor … one whose performance makes the viewer wince during a movie, who distracts from an ensemble scene, who fails to make a fictional character come to life. A “bad actor chemical” is similar, because its poor behavior and reactions overshadow its usefulness in a product. The kind of traits that make a chemical a “bad actor” include:

- Toxic or poisonous;
- Causes cancer;
- Changes genetic material;
- Interferes with normal reproduction;
- Disrupts the endocrine system (synthetic hormones);
- Causes serious eye damage;
- Causes hyper-reaction in the airways;
- Causes skin rashes or irritations;
- Accumulates in the body;
- Affects fish and other aquatic organisms;
- Depletes the ozone layer.

Human bodies are the repository for countless chemicals encountered in everyday experiences and found in common consumer products. For a developing fetus, exposure to these substances is unavoidable.

At each stage of life, toxic chemicals may hinder normal development. Even before their first breath, insurmountable challenges, from premature birth to birth defects, await an increasing number of children.

Premature birth, which raises the risk for reduced intelligence and learning and attention problems throughout life, is 23 percent more common now than in the 1980s in the United States. One potential factor may be phthalates, since babies exposed to a common phthalate in utero are born a week earlier on average than babies without exposure.

Birth defects are the leading cause of infant death in the U.S. While the specific causes of most birth defects are unknown, they could be linked to a variety of chemical exposures, including phthalates and Bisphenol-A. In male lab rats, phthalate exposure in utero leads to undescended testicles and malformed urinary tracts. The frequency of these conditions in baby boys doubled from 1970 to 1993 in the United States. In experiments with mice, bisphenol-A can induce the genetic defect that causes Down’s syndrome, at levels comparable to those found in women tested to date.
Neurodevelopmental and mental health disabilities are rapidly rising in California. Autism cases in California have more than tripled since 1994, and the number of students in public schools with learning disabilities increased 65% from 1985 to 1999. No one cause has been implicated, but scientific evidence raises questions regarding numerous potential factors, including exposure to toxic flame retardants, bisphenol-A, perchlorate, and the well-established culprits lead and mercury. Consider that flame retardants given to newborn mice in small doses permanently impair their learning and behavior, and small doses of bisphenol-A produce hyperactivity. Also, the rocket fuel component perchlorate, found in the drinking water sources of 16 million Californians, affects the thyroid hormone system at very low levels of exposure. Children born to mothers with thyroid problems have higher rates of learning disabilities.

As children develop into young adults, they struggle with the rapid changes in their bodies that lead to sexual maturity. However, several unexplained trends suggest that children face additional health challenges at this stage of life, including early puberty and obesity. In the last four decades, the number of obese adolescents in the U.S. has quadrupled, and girls in the U.S. appear to be reaching puberty six months to one year earlier than in the past, with a small number of girls developing breast tissue when they are as young as three years of age. Both trends could be tied to endocrine-disrupting chemical exposures in utero. Rodents exposed to bisphenol-A give birth to female offspring that grow faster, weigh more, and enter puberty earlier. If applicable to humans, these effects could predispose exposed children toward obesity and early puberty.

Finally, upon reaching adulthood, many people choose to have children of their own. However, chemical exposures may be contributing to infertility and other reproductive difficulties.

Sperm density has declined 40% in the U.S. since World War II. Exposure to phthalates and flame retardants may be contributing to this trend. Men with high levels of phthalates in their urine tend to have low levels of sperm production; meanwhile, male rats exposed to even a single low dose of PBDE flame retardants while in the womb have significantly decreased sperm counts.

WHY THE TOXIES?

Every year, households across California, and the entire nation, turn their eyes towards the red carpet at the Academy Awards to see famous actresses in glamorous gowns, and to root for favorite films and actors. While many of these Hollywood personalities have no real impact on our daily lives, “The Toxies” is the first red carpet awards ceremony that highlights bad actor chemicals for the real implications they have on everyday Californians. While the award categories may sound similar, these bad actors are dangerous, ubiquitous, and have nefarious careers. Through personifying each chemical and featuring them on the well known red carpet, we hope that Californians might start to recognize them in their daily lives, and start connecting their dangerous traits to personal health and their environment. This year’s Toxie award recipients and their short bios are included here. (For full-page headshots and bios, see Section II.)
**Bisphenol A (BPA)** began her career as an estrogen impersonator in the 1930s, making her a true a grandame of the craft. After trolling the B list for several years as a contract player, polymer chemists plucked her from obscurity for a lead role in polycarbonate plastics. Suddenly BPA was all the rage, every agent in town wanted her. BPA booked diverse roles in everything from baby bottles, canned food liners, and reusable food and water containers, in an effort to show her range. Yet with her phone ringing off the hook, and gift suites packed with eco-friendly water bottles, she still never forgot where it all started for her. She’s kept to her estrogen impersonating beginnings, and has been linked to breast cancer, prostate cancer, infertility in men and women, and early onset puberty in girls. BPA has always said she wanted to impact humanity. Always one to make the unexpected choice, insiders speculate that her next ventures may reveal her associations with Type-II diabetes, obesity, ADHD, autism, and erectile dysfunction. Wonder what her male leads will have to say about that!

**Formaldehyde** is a classic performer, much lauded by other bad actors for her tour de force performances. Lest her reputation precede her, Formaldehyde has shown that she still has the goods to deliver toxins around the world. Used for 150 years in embalming fluid, adhesive, fungicide, germicide and disinfectant, she has turned what should have been the twilight of her career into a resurgence. She has been tapped to appear in many common products, including particle board used for certain cribs and changing tables, paints, cleaning supplies, and some beauty products in which she shines as a member of the “Toxic Trio”.

Depending on her specific role, Formaldehyde is an acting chameleon, having been linked to asthma and various types of cancers. A true veteran, her name has long graced California’s Proposition 65 List.

**Hexavalent Chromium**, also known as Hex Chrome or Chrome 6, smashed onto the scene making his movie debut in 2000, playing the villain in the movie Erin Brockovich. His performances in industrial processes earned him a spot on California’s Proposition 65 List in December 2008 and the reputation of a hard hitting bad boy.

In high demand, Hex Chrome has touched the lives of many through inhalation, ingestion, and dermal contact around communities and schools. He boasts 2,208 appearances in monitored drinking water sources, and being taken in by more than 33 million Californians between 1998 and 2003. Hex Chrome is a known carcinogen and reproductive toxicant for both males and females, and holds the record for being the most toxic form of the element chromium. Hex Chrome has solidified his role as the go-to bad boy of our generation.
**Hydrofluoric Acid** (HF) recently starred in the movie *Saw VI*, in which he applied himself to melt body parts during a particularly memorable scene. Considered very difficult to work with, this diva of a compound is highly corrosive and has a history of destruction. HF stars in productions of high-octane gasoline, refrigerants, herbicides, pharmaceuticals, aluminum, plastics, electrical components, and fluorescent light bulbs.

Volatile and unpredictable, HF's personal life has not been much better. His marriage woes were splashed all over the tabloids when his wife filed a restraining order against him after finding out that splashes of HF on the skin can be fatal. HF has also gained a reputation around town among the ladies as “Creepy-Crawler”--those who survive after HF inhalation often suffer lingering chronic lung disease.

**Lead** has solidified his place as one of the most versatile, household names in bad acting. He has touched and poisoned the lives of millions from Ancient Rome to today's urban dwellings – Silverlake, watch out! Even though his performances have been recognized as toxic for hundreds of years, his complex ability to cause damage has only recently been understood. So subtle were his performances, that before anyone knew it, Lead had penetrated everything from paint, piping, children's toys, baby bibs, jewelry, handbags, lunchboxes, artificial turf, wheel weights, candy, and a range of industrial applications.

Lead has a profound ability to damage children’s intellectual and behavioral development. Serious, parental discretion is advised. No safe threshold for Lead has ever been discovered, and his performances continue to be linked with learning disabilities, infertility, cancer, and increased risk of heart attacks. Lead is a proud, charter member of California’s Proposition 65 List.

**Mercury**'s performances leave maddening effects on audiences around the world. Although his reputation for causing nervous system damage and birth defects precedes him, many still don't appreciate just how many performances Mercury continues to star in. A slick character, his metal beginnings are as a shiny, odorless liquid, but he's versatile enough to become a colorless, odorless gas when heated. And with this leading man's temper, that happens all the time. His airborne roles occur during coal burning and waste incineration.

Keep an eye out for him in fluorescent light bulbs, thermometers, dental fillings, batteries, auto switches, and more. The build up of Mercury in fish and other animals gets passed up the food chain. So, combined with airborne effects, Mercury has put about 60,000 children born each year at risk for his neurodevelopmental effects. This special kind of actor drives audiences crazy.
Fresh off the bus and new to town, **Methyl Iodide** has only recently appeared on the scene as a soil fumigant, registered in the final days of the Bush administration for use as a pesticide. Prior to his agricultural debut, he was used in industrial processes and laboratory research settings where, among other uses, Methyl Iodide was employed to induce cancer.

His propensity to produce cancer has landed him a spot on California's prestigious Proposition 65 List, and he’s associated with neurotoxic effects and thyroid disease. Methyl Iodide is currently taking method classes at the Ag Actors Warehouse and auditioning as Methyl Bromide’s understudy in California’s strawberry fields.

**N-Methyl Pyrrolidone** (NMP) is an industrial solvent used extensively in chemical processing, and now makes frequent appearances as a paint stripper and graffiti remover. NMP has been kicking around for decades – usually in supporting, character roles or as a ‘catalyst” in chemical mixtures whose other toxic ingredients got all the headlines. In the 1990s, NMP made up 60% of certain photoresist mixtures used in the so-called ‘clean industry’ of semiconductor fabrication. NMP has recently come into his own as his reputation for reproductive and testicular toxicity has finally come out of the shadows. Currently, NMP is appearing as a graffiti remover.

**Polybrominated Diphenyl Ether** (PBDE) is the matriarch of a whole family of flame retardant performers. If you play with PBDE’s fire retardant ways, you just might get burned. This thespian has a bad tendency to escape many of the products in which she appears, such as furniture, pillows, and bedding. She accumulates inside people, animals, and the environment. PBDE’s performance in strollers, cribs, and car seats are virtually required in California, but not in any other state. Stealing the show is one thing, but PBDE takes it to another level. As PBDE makes her way from the products into the people who use them, she’s associated with impairing attention, learning, and memory. The town has started to catch on to PBDE’s scene stealing ways, but California’s infatuation with this bad actor still has a strong legacy.

**Perchloroethylene**, Perc for short, is well known for keeping your clothes toxic...ahem...dry cleaned. His membership in California’s prestigious Proposition 65 List is just one claim to fame. Don’t be fooled by his charming smile and good looks - that dizziness and nausea you feel when you’re around him might actually be damaging your central nervous system, kidneys, liver, and reproductive system. The industry has lost wardrobe stylists all over town due to their unwillingness to work with Perc and his diva demands. In California, the dry cleaning industry emits about 3 million pounds of this bad actor per year. Perc is most often inhaled by the owners and workers in the dry cleaning industry, which are usually small mom and pop operations. Unlike most actors, Perc wants you to keep the wardrobe after a shoot. Beware of that charm, it masks his true intentions.
Perchlorate's exciting roles as an oxidizer in rocket fuel, explosives, airbags and fireworks sometimes makes viewers forget about her more insidious role as a contaminant in drinking water. Her performances as a bad actor chemical interfere with iodide uptake into the thyroid gland, causing hypothyroidism in mothers, and negatively impacting proper childhood development such as decreased learning capability.

While no one denies Perchlorate's ability to light up the sky and screen, she's been known to make her way into the drinking water sources for over 20 million Californians, and into the groundwater or soil of 43 states. Unfortunately, her "special effects" aren't contained, and are toxic to communities who unwillingly catch her performances in their drinking water!

Perfluorinated Compound (PFC) represents a family of industrial strength bad actors widely used as water, stain and grease repellant for food wrap, carpet, furniture, and clothing. She is best known for her role as PFOA, aka Teflon, which can be found flaking off of nonstick pans in kitchens across the country. Once you see her in action, it will be hard to shake her. That wondrous "nonstick" performance leaves a lasting impression by accumulating in your body and the environment, described by the US EPA as combining "persistence, bioaccumulation, and toxicity properties to an extraordinary degree".

PFC has signed a multipicture deal to harm major organs such as ovaries, liver, kidney, spleen, thymus, thyroid, pituitary, testis, and she keeps coming back for repeat performances since no one actually knows how to get rid of her! She has no known biological or environmental breakdown mechanism, which is good for studio bosses and bad for us.

Phthalate represents a family of chemical bad actors who first entered the business in the 1920s. Five members of her family have been inducted into California's Proposition 65 List for causing cancer. Her most prominent roles include softening the scene in PVC/vinyl products and making plastics more flexible and durable. She's starred in children's toys, food packaging, vinyl shower curtains, and numerous medical devices.

After being discontinued in some plastics, Phthalate is receiving widespread attention for her roles in fragrances, lotions, shampoos, nail polish, and cleaning products. As softening and sweet-smelling as she may appear to be, Phthalate's performances in these roles brings along cancer and reproductive harm, including birth defects of the penis and other indications of demasculinization. That is some body of work.
**Toluene** had a starring role 30 years ago in the horror classic, “Fetal Solvent Syndrome,” in which her appearances to pregnant moms was linked to brain damage and various birth malformations. She’s an organic solvent and thus a common ingredient in many paints, glues, cleaning products, and even nail polish, and has a knack for targeting your central nervous system with her toxicity.

Toluene has made a career for herself as the best friend who turns on her costars in the third act. Her name has graced the Proposition 65 List for several decades, and when she combines with her favorite bad girl actors (formaldehyde and dibutylphthalate), she more than doubles her damage as a member of the "Toxic Trio". She’s also a close chemical relative of benzene, known for decades to cause leukemia. With that kind of family legacy, her agents hope to keep Toluene working for years to come.

**Trichloroethylene**, also known as TCE, is well known for his use as an industrial solvent. Initially commissioned as an anesthetic, TCE was discovered to cause cardiac arrhythmias and fetal toxicity, thus ending his explicit career in medical, food, and pharmaceutical industries and his castability on network hospital dramas. Unfortunately, he still seems to find work having moved on to other deceptively macho roles like rogue astronauts and angry drill sargents. His aerospace and military performances spill over into the groundwater of surrounding communities, poisoning drinking water.

The consumption of small amounts of TCE over time is tied to impaired immune system function, liver and kidney damage and impaired fetal development in pregnant women. For workers and others exposed to TCE through inhalation performances, he can cause unconsciousness, impaired heart function and death. Don't get too close, or this bad actor will have you at hello.

**Triclosan** (who often goes by such stage names as Microban) is a newcomer on the scene, but is credited with being a trendsetter and creating the “Antibacterial” craze. In the absence of any reviews to prove him more skilled than the classic performer “Soap and Water”, Triclosan has thumbed his nose at critics and become an explosive fad, permeating homes and schools across the country in soaps, toothpaste, antiperspirants, household cleaners, and more. What most fans don’t realize is that Triclosan is a pesticide who brings along toxic entourage characters such as dioxin, methyl triclosan, and chloroform. When they are together and the party is over, evidence links them to cancer, thyroid disruption, and even causes resistance to antibiotics. Your doctor and your plastic surgeon recommend avoiding this particular bad actor.
POLICY RECOMMENDATIONS

Winnowing a list of chemicals for this report was no easy task. There are scores of chemicals that adversely affect human health in use in California, and the state is trying to develop a comprehensive approach to identifying toxic chemicals, prioritizing them, studying the options for safer alternatives, and then phasing out the “bad actors.”

The state’s Department of Toxic Substance Control (DTSC) is responsible for writing the regulations that will implement California’s Green Chemistry Initiative. The agency will write regulations based on its interpretation of the legislation passed in 2008. To be meaningful, the Green Chemistry Initiative should be more than a voluntary, incentive-based program. The state needs to create the regulatory infrastructure – even if it needs to collect fees from manufacturers – to assess chemical safety and restrict or phase out the use of the most dangerous substances. The Green Chemistry Initiative should:

Require chemical manufacturers to prove that a chemical is safe before allowing it on the market.

- Regulators should require companies to provide comprehensive data on the intrinsic hazards of chemicals that they produce or import into California. Such data should include information on a chemical’s ability to persist in the environment, accumulate in living organisms, be metabolized into other hazardous compounds, cause genetic damage, mimic important hormone signals, interfere with human development or reproduction, weaken the immune system, damage the nervous system, cause respiratory disease, or otherwise harm human health.

- Chemical testing should include specific consideration of potential impacts on infants, children, and pregnant women; potential impacts of low-dose exposures; and potential interactions with other toxic chemicals.

- The reliability and adequacy of the information should be validated by government scientists and/or an independent third party free of conflicts of interest.

- Allowances for ingredient secrecy based on claims of “confidential business information” should be limited.

Empower regulatory agencies to restrict or ban the manufacture and use of chemicals that pose potential dangers to human health or the environment.

- Where chemicals show evidence of intrinsic hazard – such as a tendency to persist in the environment, accumulate in living organisms, or cause toxic effects – regulators should restrict or prohibit the use of these chemicals and require the substitution of safer alternatives, particularly in consumer products or other applications that lead to human exposure. In addition, regulators should consider possible adverse impacts to ecosystems.

- State agencies should lead the effort to identify and prioritize chemicals of concern and direct an appropriate regulatory response, based on a chemical’s ability to cause harm.
• Where there is uncertainty in the evidence, regulators should err on the side of protecting health and the environment. In other words, “no data, no market.”

Ensure public access to information on chemicals and their uses.

• The public has a right to know about chemicals currently on the market, including their specific uses, potential hazards to health and the environment, and potential routes of exposure. California’s Toxics Information Clearinghouse, signed into law by Governor Schwarzenegger in 2008, should be an easily understood database for all chemicals currently in use. This tool should enable businesses and consumers to compare the safety of chemicals, identify missing data, and create demand for safer alternatives.

• Until health and safety data are available for a particular chemical, there should be mandatory labeling for consumer products indicating the presence of a chemical that has not been tested for its impact on human health.
REFERENCES

Below is a list of science and policy references used for the bad actor chemicals referenced in this report.

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**Worst Performance in a Horror Film**

*Hydrofluoric Acid (HF)*
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His propensity to produce cancer has landed him a spot on California’s prestigious Proposition 65 List, and he’s associated with neurotoxic effects and thyroid disease. Methyl Iodide is currently taking method classes at the Ag Actors Warehouse and auditioning as Methyl Bromide’s understudy in California’s strawberry fields.
N-Methyl Pyrrolidone (NMP) is an industrial solvent used extensively in chemical processing, and now makes frequent appearances as a paint stripper and graffiti remover. NMP has been kicking around for decades – usually in supporting, character roles or as a ‘catalyst” in chemical mixtures whose other toxic ingredients got all the headlines.

In the 1990s, NMP made up 60% of certain photoresist mixtures used in the so-called ‘clean industry’ of semiconductor fabrication. NMP has recently come into his own as his reputation for reproductive and testicular toxicity has finally come out of the shadows. Currently, NMP is appearing as a graffiti remover.
Polybrominated Diphenyl Ether (PBDE) is the matriarch of a whole family of flame retardant performers. If you play with PBDE’s fire retardant ways, you just might get burned. This thespian has a bad tendency to escape many of the products in which she appears, such as furniture, pillows, and bedding. She accumulates inside people, animals, and the environment.

PBDE’s performance in strollers, cribs, and car seats are virtually required in California, but not in any other state. Stealing the show is one thing, but PBDE takes it to another level. As PBDE makes her way from the products into the people who use them, she’s associated with impairing attention, learning, and memory. The town has started to catch on to PBDE’s scene stealing ways, but California’s infatuation with this bad actor still has a strong legacy.
Perchlorate's exciting roles as an oxidizer in rocket fuel, explosives, airbags and fireworks sometimes makes viewers forget about her more insidious role as a contaminant in drinking water. Her performances as a bad actor chemical interfere with iodide uptake into the thyroid gland, causing hypothyroidism in mothers, and negatively impacting proper childhood development such as decreased learning capability.

While no one denies Perchlorate's ability to light up the sky and screen, she's been known to make her way into the drinking water sources for over 20 million Californians, and into the groundwater or soil of 43 states. Unfortunately, her "special effects" aren't contained, and are toxic to communities who unwillingly catch her performances in their drinking water!
Perchloroethylene, Perc for short, is well known for keeping your clothes toxic...ahem...dry cleaned. His membership in California's prestigious Proposition 65 List is just one claim to fame. Don’t be fooled by his charming smile and good looks - that dizziness and nausea you feel when you’re around him might actually be damaging your central nervous system, kidneys, liver, and reproductive system.

The industry has lost wardrobe stylists all over town due to their unwillingness to work with Perc and his diva demands. In California, the dry cleaning industry emits about 3 million pounds of this bad actor per year. Perc is most often inhaled by the owners and workers in the dry cleaning industry, which are usually small mom and pop operations. Unlike most actors, Perc wants you to keep the wardrobe after a shoot. Beware of that charm, it masks his true intentions.
Perfluorinated Compound (PFC) represents a family of industrial strength bad actors widely used as water, stain and grease repellant for food wrap, carpet, furniture, and clothing. She is best known for her role as PFOA, aka Teflon, which can be found flaking off of nonstick pans in kitchens across the country. Once you see her in action, it will be hard to shake her. That wonderous "nonstick" performance leaves a lasting impression by accumulating in your body and the environment, described by the US EPA as combining "persistence, bioaccumulation, and toxicity properties to an extraordinary degree".

PFC has signed a multipicture deal to harm major organs such as ovaries, liver, kidney, spleen, thymus, thyroid, pituitary, testis, and she keeps coming back for repeat performances since no one actually knows how to get rid of her! She has no known biological or environmental breakdown mechanism, which is good for studio bosses and bad for us.
Phthalate represents a family of chemical bad actors who first entered the business in the 1920s. Five members of her family have been inducted into California's Proposition 65 List for causing cancer. Her most prominent roles include softening the scene in PVC/vinyl products and making plastics more flexible and durable. She's starred in children's toys, food packaging, vinyl shower curtains, and numerous medical devices.

After being discontinued in some plastics, Phthalate is receiving widespread attention for her roles in fragrances, lotions, shampoos, nail polish, and cleaning products. As softening and sweet-smelling as she may appear to be, Phthalate's performances in these roles bring along cancer and reproductive harm, including birth defects of the penis and other indications of demasculinization. That is some body of work.
Toluene had a starring role 30 years ago in the horror classic, “Fetal Solvent Syndrome,” in which her appearances to pregnant moms was linked to brain damage and various birth malformations. She’s an organic solvent and thus a common ingredient in many paints, glues, cleaning products, and even nail polish, and has a knack for targeting your central nervous system with her toxicity.

Toluene has made a career for herself as the best friend who turns on her costars in the third act. Her name has graced the Proposition 65 List for several decades, and when she combines with her favorite bad girl actors (formaldehyde and dibutyl-phthalate), she more than doubles her damage as a member of the “Toxic Trio”. She’s also a close chemical relative of benzene, known for decades to cause leukemia. With that kind of family legacy, her agents hope to keep Toluene working for years to come.
Trichloroethylene, also known as TCE, is well known for his use as an industrial solvent. Initially commissioned as an anesthetic, TCE was discovered to cause cardiac arrhythmias and fetal toxicity, thus ending his explicit career in medical, food, and pharmaceutical industries and his castability on network hospital dramas. Unfortunately, he still seems to find work having moved on to other deceptively macho roles like rogue astronauts and angry drill sargents. His aerospace and military performances spill over into the groundwater of surrounding communities, poisoning drinking water.

The consumption of small amounts of TCE over time is tied to impaired immune system function, liver and kidney damage and impaired fetal development in pregnant women. For workers and others exposed to TCE through inhalation performances, he can cause unconsciousness, impaired heart function and death. Don’t get too close, or this bad actor will have you at hello.
Triclosan (who often goes by such stage names as Microban) is a newcomer on the scene, but is credited with being a trendsetter and creating the “Antibacterial” craze. In the absence of any reviews to prove him more skilled than the classic performer “Soap and Water”, Triclosan has thumbed his nose at critics and become an explosive fad, permeating homes and schools across the country in soaps, toothpaste, antiperspirants, household cleaners, and more. What most fans don’t realize is that Triclosan is a pesticide who brings along toxic entourage characters such as dioxin, methyl triclosan, and chloroform. When they are together and the party is over, evidence links them to cancer, thyroid disruption, and even causes resistance to antibiotics. Your doctor and your plastic surgeon recommend avoiding this particular bad actor.