

DRUG CHECKING REPORT

2011

ENERGY CONTROL



Created from the results of the Drug Checking service of Energy Control in 2011.

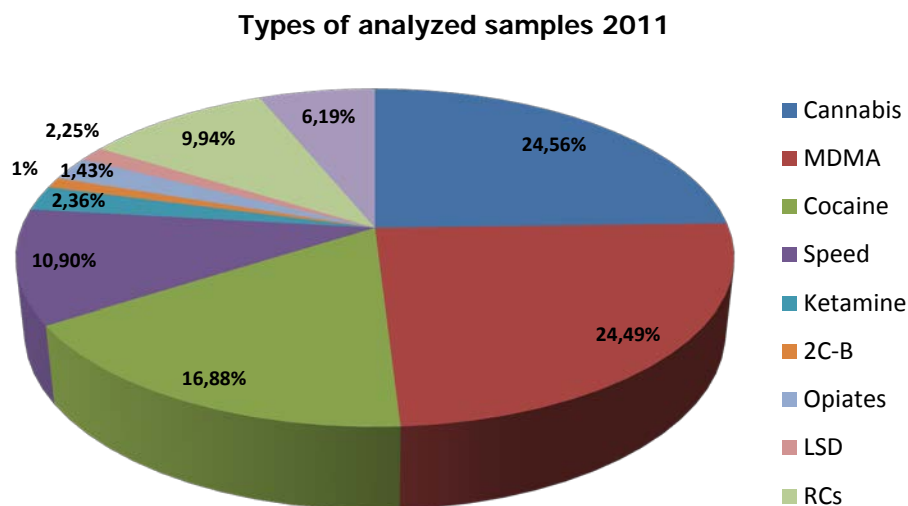
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Type of analyzed substances

During 2011 we've analyzed a total of 2.797 samples of psychoactive substances. As usual in our service, the most analyzed substances were MDMA, cocaine and speed, which matches the most used substances in recreational environments. However, we can also highlight the number of samples of ketamine, opiates, LSD and 2C-B.

As you can see in the following chart, beside this type of substances, we find the category of "others" where we include substances of minority use and that are analyzed few often times (ephedrine, mescaline, methamphetamine, etc.)



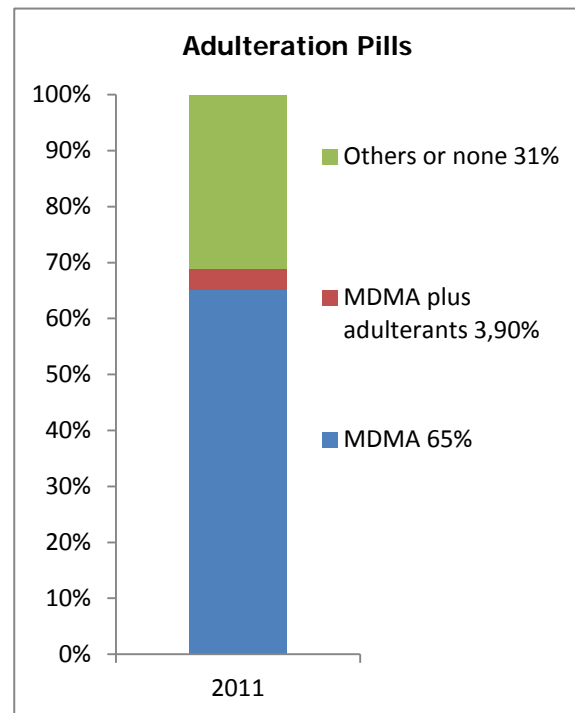
The number of analyzed Research Chemicals (RC) is increasing, a growing phenomenon that we've been observing in the last few years. During 2011 we analyzed 278 samples of the New Substances so called RCs, detecting 65 different substances.

As a novelty, during 2011 we have analyzed 687 samples of cannabis, mainly in cannabis events. Due to the campaign "[Apadrina nuestro cogollo](#)", Energy Control was able to gather enough money to test cannabis samples on a regular base in our offices in 2012.

Composition and adulteration of the tested samples

MDMA in pills

In 2011 we've analyzed **203 pills sold as MDMA: 65% contained only MDMA and 4% contained MDMA with an adulterant.** The remaining 31% didn't contain MDMA at all; instead we found other substances, sometimes not even psychoactive. As so, **the adulteration rate observed in MDMA pills analyzed by our service is inferior to the one of previous years.** Furthermore, we have also observed an increment on the doses of MDMA. The average dose of the 86 pills that were quantified has been of 94 mg. This dosage has increased considerably if we compare it with the average dosage of 2010 (79 mg).



As for adulterants found in pills, their presence in 2011 has been more reduced. The most frequent adulterants were **m-CPP** (present in 10% of the analyzed pills), **caffeine** (in 1%); and in less than 1% of the samples, **2CB** and **metoclopramide**. For further results see [analyzed pills in 2011](#).

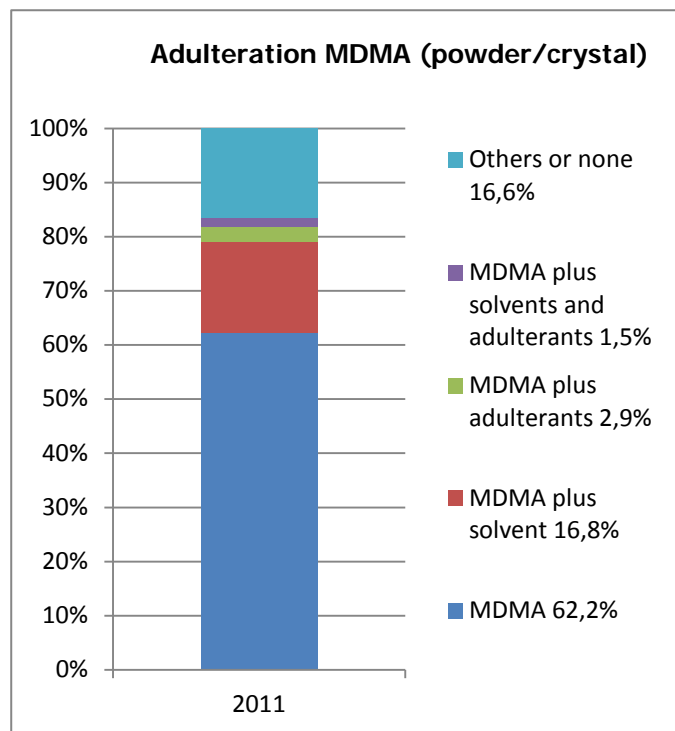
In the final part of this report you can find a small glossary with the description of the adulterants found in 2011.



MDMA in powder/crystal

As we've been observing in the past years, MDMA's composition varies with its presentation, meaning it depends on whether it's sold as a pill or as crystal.

From the **482 samples of analyzed MDMA in crystal/powder form, 62% contained only MDMA, without adulterants**. Almost 20% of the samples contained MDMA and a **solvent (17%)** or some **adulterant (3%)**. Although solvents are inactive substances (added to raise volume and weight to samples) they reduce considerably the purity of ecstasy, forcing people to increase the amount of ingested product. Only 1,5% of samples contained MDMA plus adulterants and solvents.



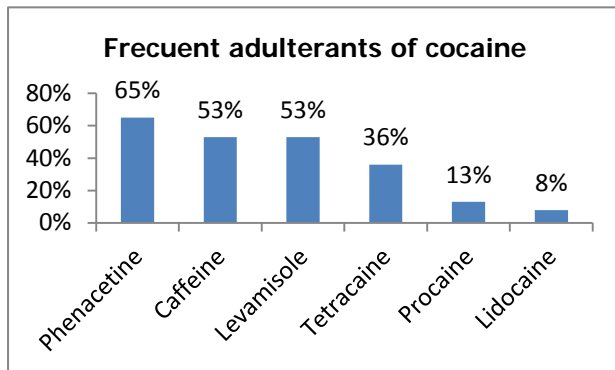
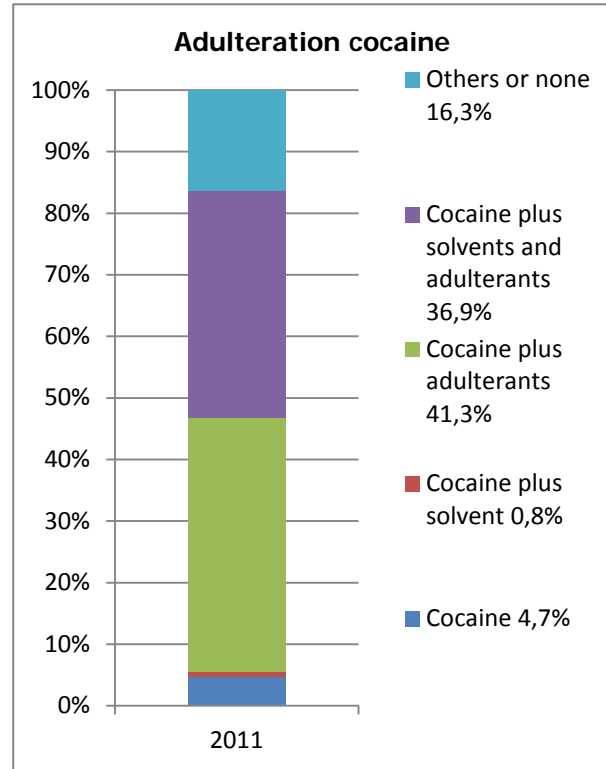
Finally, 17% of crystal/powder samples sold as MDMA contained other substances, compared to the 31% in pills. **One of the detected substances sold as MDMA was methamphetamine, found in 21 samples**. For further information please see the [warning](#) casted in the summer of 2011.

Among the adulterants found in MDMA (crystal/powder), there's **caffeine** (present in 4% of the total), local anaesthetics like **procaine** and **lidocaine** (also in 4% of the total), **dextromethorphan** (2%) and **m-CPP** in only one sample.



Cocaine

In 2011 we've analyzed **472 samples of cocaine**, and as usual, **the amount of samples that contained only cocaine was very little: only 5% of the total**. In fact, we found in cocaine samples analyzed in 2011 a variety of combinations of different products: 41% of samples contained cocaine plus adulterants; almost 37% contained cocaine plus adulterants and solvents; and almost 1% contained cocaine and solvents. 16% of the samples didn't contain cocaine at all (in these cases the most frequent combination was caffeine with local anaesthetics).

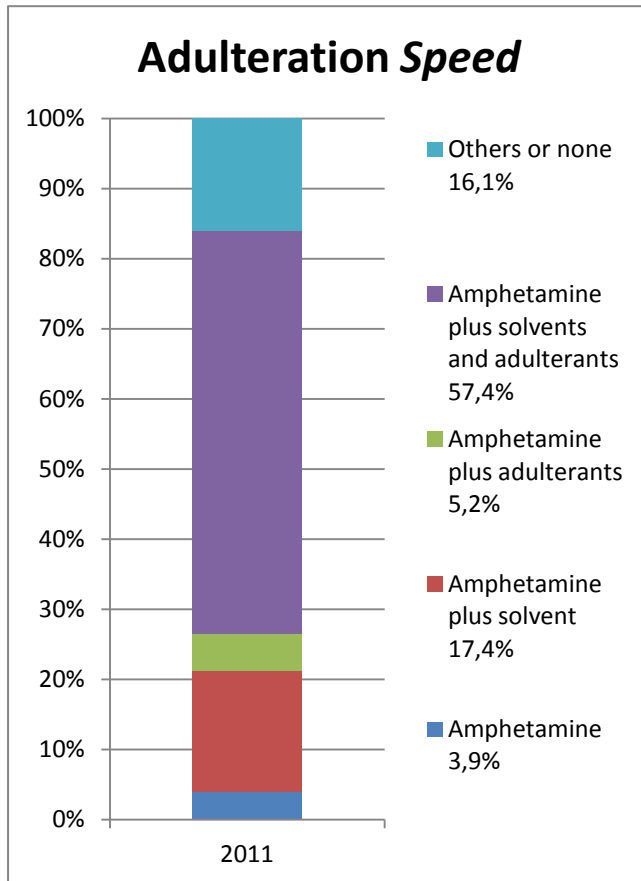


Compared to others, cocaine is the substance where we found the larger number of adulterants. The most frequent has been **phenacetine**, present in 65% of the total of samples, followed by **levamisole** and **caffeine** (both present in 53% of samples). Other usual adulterants found are the local anaesthetics, specially **tetracaine** (36%), **procaine** (13%) and **lidocaine** (8%). Although all of these adulterants can present risks

(see annex), levamisole is the one raising more concern because of the potential toxic effects that it can produce in cocaine users, especially the ones who have frequent consumptions, the ones that inject it and also the ones who have vulnerability to levamisole toxic effects¹.

¹ For more information: Ventura, M.; Caudevilla, F.; Vidal, C., y Grupo Investigadores SELECTO (2011). Cocaina adulterada con levamisol: posibles implicaciones clínicas. Medicina Clínica, 136(8), 365-368.

Amphetamine (*Speed*)



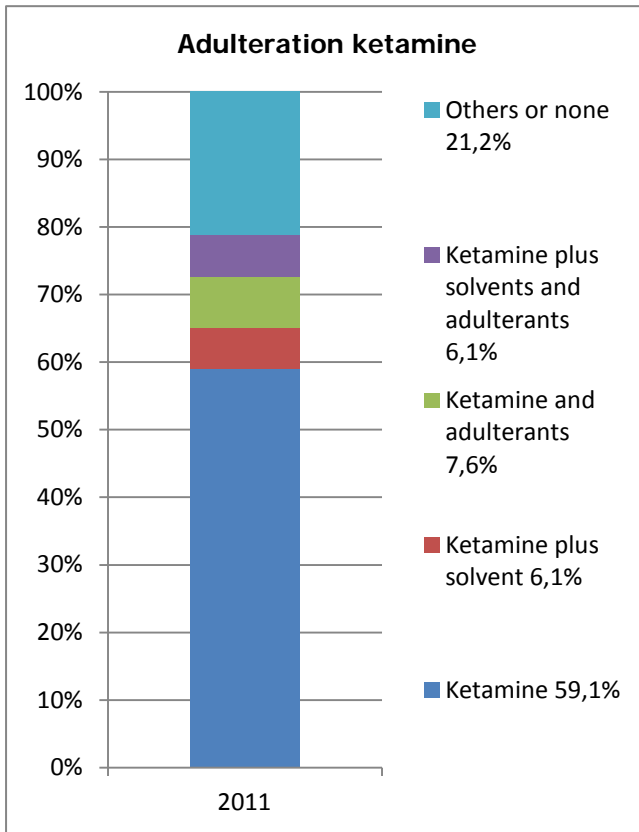
Speed is another substance in which we found higher values of adulteration. From the **305 analyzed samples, only 4% contained exclusively amphetamine**. In the remaining cases, we found different combinations of amphetamine with adulterants and/or solvents. 16% of the samples didn't contain amphetamine at all; instead we found other substances, like 4-FMP and caffeine. However during 2011 *speeds* without caffeine appeared more frequently, in 21% of samples. This tendency has increased if we compare with results of 2010, where only 10% of samples were caffeine free.

The main adulterant is still **caffeine**, found in 79% of analyzed samples. We have also detected the presence of **DPIA** in 17% of samples and **paracetamol** in 9%.



Also, we've observed that more than one third of speeds (34%) were presented in a form of paste instead of powder. Although users tend to believe that this type of presentation means speed is less adulterated, the fact is that this type of texture reveals the presence of organic solvents as toxic as methanol. The recommendation from Energy Control to users is that they dry the sample before using it in order to avoid getting intoxicated by these solvents.

ketamine



In 2011, we've analyzed **66 samples of ketamine**, which represents 2% of the total of analyzed samples. Therefore the data we present about its composition should be read carefully. From these **66 samples of ketamine**, **39 contained exclusively ketamine**, whereas the rest of samples were combinations of ketamine with an adulterant (8%) or with a solvent (6%). Only 4 samples contained a combination of ketamine, adulterant and solvent.



However we did observe this year that **ketamine's adulteration has risen compared with other years and that 21% of samples were in fact new substances like mephedrone or methoxetamine**. Users that took methoxetamine thinking it was ketamine have reported unpleasant effects, more psychedelic, with more paranoia and longer lasting than ketamine using the same dosages. We found several adulterants in ketamine

samples – the most frequent was **azosemide**, present in 10 of the 66 samples (15%). We've also detected caffeine in 6% of the analyzed substances.

Heroin

In 2011 we've analyzed **59 samples of heroin and all of them were adulterated**. The main adulterant was **caffeine** (95%), followed by paracetamol (68%). In 19 samples (32%) we've detected **dextromethorphan**. We are not aware of the motive why dextromethorphan is being added to heroin, but users have reported very unpleasant side effects.

New Substances or RCs

"Research Chemicals", "RCs", "Legal Highs" or "New Synthetic Substances" are the names by which a series of new substances are known by the general public. They are substances synthesized in the past decades with investigation purposes that have appeared and have been diffused recently among the general public. There is very scarce or sometimes inexistent data from clinic investigation in animals or humans. We can find most information about these substances in Internet and their use is generally restricted to small social groups.

We've analyzed **278 samples of the so called Research Chemicals (RCs), detecting 65 different substances**. The most analyzed substance inside this category was **mephedrone** (46 samples), followed by **methylone** (41 samples), **methoxetamine** (24 samples) and **4-MEC** (18 samples). The analysis have allowed us to observe how the adulteration of RCs has increased and how in some cases they've been used as adulterants to other more common illegal drugs: in 12 cases, methylone has been sold as an adulterant of other substances, mainly MDMA; in 14 samples, mephedrone has adulterated other substances like cocaine, MDMA, 2C-B and ketamine. Methoxetamine was detected being sold as ketamine in 4 samples and as an adulterant in 2 samples of mephedrone. 4-MEC has been used as an adulterant of other RCs, sold as false methylone and false mephedrone.



Inside the category of RCs there are also the **37 samples sold as "Legal Highs"**. These products, sold as substitutes of illegal drugs, don't specify their composition, and when they do, this composition is either false or incomplete. The analyses have revealed in most cases the presence of RCs. In one sample we've detected a dangerous substance called [PMMA](#). In summer we diffused a report with the composition of some of these products that we've analyzed, for further information see EC's [Legal Highs Report](#).

Cannabis

As a novelty, during 2011, we've analyzed **687 samples of cannabis**, mainly in cannabis events (fairs). The majority were marihuana samples (74% of total) and the remaining was hashish (24%). We've also analyzed a few samples of cannabis oil that represented less than 2% of the total.

The cannabis analysis system performed by EC is based in the following two techniques:

- **Observation of the sample with a binocular magnifying lens or with an USB magnifying lens**, with 40 to 200 magnifying levels. This allows us to identify contaminants in the plant and some types of adulterants in hashish samples.
- **Qualitative and quantitative analysis using thin layer chromatography (TLC)**. With this technique we can identify the majority of cannabinoids present in the samples (THC, CBD, CBN, CBG and CBC). It can also provide an approximated quantification of THC and CBD. In order to know the types of effects that cannabis induces, it's important to know the concentrations of THC and CBD. Because it diminishes side effects of THC, the presence of CBD is recommended, even if it's scarce.



As for contaminants and adulteration, the methodology used by EC, at the moment, can only detect the presence of odd substances but it can't identify them. We only observed a few samples of marihuana plants contaminated with fungus and some few samples of hashish with the presence of a compact substance and other added materials. In the majority of hashish samples we detected the presence of vegetable fibres. We've alerted users to the presence of contaminants and adulterants because by smoking these substances people may inhale irritant and harmful compounds. The presence of fibres indicates a method of mechanic pressure in fabricating hashish, decreasing its resin purity.

In all analyzed samples, excepting one (an oil in which we only detected CBN), the most found cannabinoid was THC. The average concentration of THC found in marihuana samples was of 11%, varying between 1% and 26%. In hashish samples, the average concentration of THC was 15%, varying from a minimum of 1% and a maximum of 80%. In the oil samples, THC's average concentration was of 70%, varying from 41% to 90%. CBD was detected in very few samples of marihuana, only in 3,5% of analyzed samples. The average concentration of CBD in marihuana plants

was of 3%, varying from 0,4% to 11%. CBD was detected in the majority of hashish samples (83%). The average concentration of CBD in hashish was of 3%, varying from a minimum of 1% and a maximum of 60%. In oil samples, we detected CBD in only 2 samples. CBN was detected in 1% of samples of marihuana. The presence of CBN in marihuana plants indicates that those plants are either very old or have been poorly conserved. CBN is 10 times less psychoactive than THC, therefore, poorly conserved plants will lose psychoactive power. In hashish samples we found the presence of CBN in 4% of samples.

Conclusions

- All black market substances are likely to be adulterated. The only way of knowing for sure their composition is to test them in a laboratory. In Spain there are 3 organizations that can offer this service: [Ailaket](#) (Basque Country), [Hegoak](#) (Navarra) and [Energy Control](#).
- Ecstasy (MDMA), both in pill or crystal format, is the less adulterated substance. Despite of its low adulteration, in some cases, other substances, like methamphetamine, have been sold instead.
- The adulteration level of cocaine has been the highest found in the last years. In 2011, most cocaine samples contained cocaine combined with at least 3 other adulterants, such as caffeine, phenacetine, local anaesthetics and levamisol, being levamisol the most concerning adulterant due to its potential toxic effects.
- Although we observed in speed samples a lower presence of adulteration, comparing to previous years, in 80% of the cases we find a combination of amphetamine and caffeine.
- The adulteration of ketamine has increased and we've detected RCs like methoxetamine or mephedrone being sold instead. Because methoxetamine is a new emerging substance we ignore adverse effects that can be produced by its use. In cases where ketamine is combined with mephedrone, effects are much more difficult to predict.
- Caffeine has been detected as an adulterant in all substances.
- The labels "RC" or "Legal Highs" don't guarantee that the substances are pure, well synthesized and without harmful effects. The legal status of a substance does not indicate that it's safer or less harmful. During 2011 the adulteration of RCs has been higher than ever.
- The marijuana samples analyzed showed high concentrations of THC and low concentrations of CBD. In hashish samples, on the other hand, there was a more balanced prevalence of CBD in relation to THC.

Most found adulterants – description and risks

4-FMP: it's a stimulant, amphetamine-like, that in some cases has been sold as a fraud as other drugs. **Associated risks:** in high and repeated doses can produce hyperthermia and neurotoxicity.

Caffeine: stimulant. Acts on the central nervous system raising brain activity and the awaking state. **Associated risks:** slightly raises body temperature, breathing rhythm and gastric acid secretion. High amounts can cause anxiety, irritability, insomnia, sweating, tachycardia and diarrhea. Its chronic use is associated with syndrome of abstinence that can cause headaches and irritability.

Dextromethorphan: Opioid, antitussive. Used in pills and syrups (Romil ®) to relieve cough.

Associated risks: At high doses causes blood pressure to decrease, slow, superficial or even absence of breathing, blurred vision, spasms in the stomach and intestines, nausea, vomiting, constipation, drowsiness, hallucinations.

DPIA: amphetamine derived. Residual substance from the synthesis of amphetamine.

Associated risks: UNKNOWN.

Phenacetin: analgesic widely used in the past and removed from the Spanish market due to its toxicity. **Associated risks:** presents liver toxicity. Like paracetamol, should be avoided mixed with alcohol. In a small group of people it damages the red blood cells, causing a lack of oxygen to the tissues that can cause loss of consciousness, respiratory depression or cardiac arrest. Its chronic use is associated with nephrotoxicity that can cause incontinence or back pain.

Levamisole: Drug used in veterinary medicine as an antiparasite. It's also used in humans in chemotherapy treatments. Accentuates the specific effects of cocaine. **Associated risks:** after the ingestion it can produce dizziness, nausea and diarrhea. The continuous consumption of levamisole can cause a significant drop in the number of white blood cells and make the person more vulnerable to get infections. These symptoms may appear: fever, muscle aches, headache, insomnia, dizziness and convulsions.

Procaine, lidocaine, tetracaine: local anesthetics. Drugs that block the transmission of nerve impulses by decreasing the pain sensation. Lidocaine is the most common anesthetic in dentistry and the duration of its effect is approximately 1 ½ hours. Procaine also produces an antihistamine effect. **Associated risks:** depend on the route of administration, but tend to affect the nervous system (agitation, disjointed speech, strong will to talk, restlessness, euphoria, nausea, vomiting, disorientation, tremors, convulsions, coma or respiratory arrest) and the cardiovascular system (hypotension, bradycardia or arrhythmias).

Metoclopramide: Antiemetic. Drug used to treat nausea and vomiting. Also promotes intestinal motility. **Associated risks:** It is often found in pills with mCPP, likely to decrease side effects. However, despite this combination, vomiting tends to persist, the adverse effects of m-CPP are enhanced and tend to last longer.

m-CPP: piperazine. Experimental antidepressant with stimulant, empathogens, hallucinogens and euphoric effects. **Associated risks:** Stomach and kidney pain, headache, nausea, vomiting, anxiety, dilated pupils with difficulty focusing. Strong hangovers.

Paracetamol: this is a commonly used analgesic and antipyretic. **Associated risks:** In high doses it's toxic to the liver. Because alcohol is metabolized in the liver, it is unadvised to combine it with paracetamol, increasing the risk of liver toxicity.

PMMA: this substance is a hybrid between PMA and methamphetamine. It's been circulating in the form of pills and usually sold as MDMA or ecstasy. The majority of the uses have been produced by people thinking it was MDMA. Like PMA it's not recommended to use it because the active dose is very near to the toxic dose. There are deaths associated with this substance. **Associated risks:** the active dose is very near to the one that produces hyperthermia, hyperactivity, etc. There are deaths connected with the use of pills that contained a mixture of PMMA with PMA or PMMA with MDA, amphetamine, methamphetamine and ephedrine. It seems that the mixture of PMMA with other substances increases its toxicity.

Summary of adulterants found in the tested samples

(Frequency regarding the total number of samples)

	MDMA Pills	MDMA Crystal	Cocaine	Speed	Ketamine
Number of analyzed samples	203	482	472	254	66
Adulterants found	Caffeine: 19 2C-B: 11 2CI:2 m-CPP: 21 Metoclopramide: 5 Buflomedil: 1 TFMPP: 2 BZP:1 Dibenzilpiperazine:1 Mephedrone:3 Methamphetamine:1 3Fluoroamphetamine:1 Phenacetine:1 Metilone:1 Metiopropamine:1 Ephedrine:1	Caffeine: 21 Procaine: 16 Lidocaine: 4 m-CPP: 1 Dextromethorphan: 9 Methamphetamine:21 Metilone: 3 Mephedrone:1 MDA:1 Benzocaine:1 Tetracaine:1	Caffeine: 252 Procaine: 61 Phenacetine: 306 Lidocaine: 39 Tetracaine: 171 Buflomedil: 3 levamisole: 249 ibuprofen: 1 norcocaine: 3 Metamizole: 1 Tropacocaine:1 Aminofenazon:2	Caffeine: 203 Paracetamol: 24 4-FMP: 6 DPIA: 43 Netilfentermine:1 Metilfenidato:1 Phenacetine:1	Caffeine:4 Azosemide: 10 Paracetamol:1 Phenacetine:1 Ephedrine:2 Methoxetamine: 4 Mephedrone:4

For further information:

- About the Drug Cheking Service: <http://www.energycontrol.org/analisis-de-sustancias.html>
- About the substances: <http://www.energycontrol.org/infodrogas.html>
- About adulterants: <http://www.energycontrol.org/analisis-de-sustancias/resultados/adulterantes.html>

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Thank you all!

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