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Mass murder in the skies: was the plot feasible?

Let's whip up some TATP and find out

By [Thomas C Greene in Washington DC](#)

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Analysis The seventh angel poured out his bowl into the air;
And a loud voice came forth out of the temple of Heaven,
From the throne, saying, "It is done!"
--Revelation 16:17

Binary liquid explosives are a sexy staple of Hollywood thrillers. It would be tedious to enumerate the movie terrorists who've employed relatively harmless liquids that, when mixed, immediately rain destruction upon an innocent populace, like the seven angels of God's wrath pouring out their bowls full of pestilence and pain.

The funny thing about these movies is, we never learn just which two chemicals can be handled safely when separate, yet instantly blow us all to kingdom come when combined. Nevertheless, we maintain a great eagerness to believe in these substances, chiefly because action movies wouldn't be as much fun if we didn't.

Now we have news of the recent, supposedly real-world, terrorist plot to destroy commercial airplanes by smuggling onboard the benign precursors to a deadly explosive, and mixing up a batch of liquid death in the lavatories. So, *The Register* has got to ask, were these guys for real, or have they, and the counterterrorist officials supposedly protecting us, been watching too many action movies?

We're told that the suspects were planning to use TATP, or triacetone triperoxide, a high explosive that supposedly can be made from common household chemicals unlikely to be caught by airport screeners. A little hair dye, drain cleaner, and paint thinner - all easily concealed in drinks bottles - and the forces of evil have effectively smuggled a deadly bomb onboard your plane.

Or at least that's what we're hearing, and loudly, through the mainstream media and its legions of so-called "terrorism experts." But what do these experts know about chemistry? Less than they know about lobbying for Homeland Security pork, which is what most of them do for a living. But they've seen the same movies that you and I have seen, and so the myth of binary liquid explosives dies hard.

Better killing through chemistry

Making a quantity of TATP sufficient to bring down an airplane is not quite as simple as ducking into the toilet and mixing two harmless liquids together.

First, you've got to get adequately concentrated hydrogen peroxide. This is hard to come by, so a large quantity of the three per cent solution sold in pharmacies might have to be concentrated by boiling off the water. Only this is risky, and can lead to mission failure by means of burning down your makeshift lab before a single infidel has been harmed.

But let's assume that you can obtain it in the required concentration, or cook it from a dilute solution without ruining your operation. Fine. The remaining ingredients, acetone and sulfuric acid, are far easier to obtain, and we can assume that you've got them on hand.

Now for the fun part. Take your hydrogen peroxide, acetone, and sulfuric acid, measure them very carefully, and put them into drinks bottles for convenient smuggling onto a plane. It's all right to mix the peroxide and acetone in one container, so long as it remains cool. Don't forget to bring several frozen gel-packs (preferably in a Styrofoam chiller deceptively marked "perishable foods"), a thermometer, a large beaker, a stirring rod, and a medicine dropper. You're going to need them.

It's best to fly first class and order Champagne. The bucket full of ice water, which the airline ought to supply, might possibly be adequate - especially if you have those cold gel-packs handy to supplement the ice, and the Styrofoam chiller handy for insulation - to get you through the cookery without starting a fire in the lavvie.

Easy does it

Once the plane is over the ocean, very discreetly bring all of your gear into the toilet. You might need to make several trips to avoid drawing attention. Once your kit is in place, put a beaker containing the peroxide / acetone mixture into the ice water bath (Champagne bucket), and start adding the acid, drop by drop, while stirring constantly. Watch the reaction temperature carefully. The mixture will heat, and if it gets too hot, you'll end up with a weak explosive. In fact, if it gets really hot, you'll get a premature explosion possibly sufficient to kill you, but probably no one else.

After a few hours - assuming, by some miracle, that the fumes haven't overcome you or alerted passengers or the flight crew to your activities - you'll have a quantity of TATP with which to carry out your mission. Now all you need to do is dry it for an hour or two.

The genius of this scheme is that TATP is relatively easy to detonate. But you must make enough of it to crash the plane, and you must make it with care to assure potency. One needs quality stuff to commit "mass murder on an unimaginable scale," as Deputy Police Commissioner Paul Stephenson put it. While it's true that a slapdash concoction will explode, it's unlikely to do more than blow out a few windows. At best, an infidel or two might be killed by the blast, and one or two others by flying debris as the cabin suddenly depressurizes, but that's about all you're likely to manage under the most favorable conditions possible.

We believe this because a peer-reviewed [2004 study](http://www.technion.ac.il/~keinanj/pub/122.pdf) (in the Journal of the American Chemical Society (JACS) entitled "Decomposition of Triacetone Triperoxide is an Entropic Explosion" tells us that the explosive force of TATP comes from the sudden decomposition of a solid into gasses. There's no rapid oxidizing of fuel, as there is with many other explosives: rather, the substance changes state suddenly through an entropic process, and quickly releases a respectable amount of energy when it does. (Thus the lack of ingredients typically associated with explosives makes TATP, a white crystalline powder resembling sugar, difficult to detect with conventional bomb sniffing gear.)

Mrs. Satan

By now you'll be asking why these jihadist wannabes didn't conspire simply to bring TATP onto planes, colored with a bit of vegetable dye, and disguised as, say, a powdered fruit-flavored drink. The reason is that they would be afraid of failing: TATP is notoriously sensitive and unstable. Mainstream journalists like to tell us that terrorists like to call it "the mother of Satan." (Whether this reputation is deserved, or is a consequence of homebrewing by unqualified hacks, remains open to debate.)

It's been claimed that the 7/7 bombers used it, but this has not been positively confirmed. Some sources claim that they used C-4, and others that they used RDX. Nevertheless, the belief that they used TATP has stuck with the media, although going about in a crowded city at rush hour with an unstable homebrew explosive in a backpack is not the brightest of all possible moves. It's surprising that none of the attackers enjoyed an unscheduled launch into Paradise.

So, assuming that the homebrew variety of TATP is highly sensitive and unstable - or at least that our inept jihadists would believe that - to avoid getting blown up in the taxi on the way to the airport, one might, if one were educated in terror tactics primarily by hollywood movies, prefer simply to dump the precursors into an airplane toilet bowl and let the mother of Satan work her magic. Indeed, the mixture will heat rapidly as TATP begins to form, and it will soon explode. But this won't happen with much force, because little TATP will have formed by the time the explosion occurs.

We asked University of Rhode Island Chemistry Professor Jimmie C. Oxley, who has actual, practical experience with TATP, if this is a reasonable assumption, and she tells us that merely dumping the precursors together would create "a violent reaction," but not a detonation.

To release the energy needed to bring down a plane (far more difficult to do than many imagine, as Aloha Airlines [Flight 243](http://en.wikipedia.org/wiki/Aloha_Flight_243) (http://en.wikipedia.org/wiki/Aloha_Flight_243) neatly illustrates), it's necessary to synthesize a good amount of TATP with care.

Jack Bauer sense

So the fabled binary liquid explosive - that is, the sudden mixing of hydrogen peroxide and acetone with sulfuric acid to create a plane-killing explosion, is out of the question. Meanwhile, making TATP ahead of time carries a risk that the mission will fail due to premature detonation, although it is the only plausible approach.

Certainly, if we can imagine a group of jihadists smuggling the necessary chemicals and equipment on board, and cooking up TATP in the lavatory, then we've passed from the realm of action blockbusters to that of situation comedy.

It should be small comfort that the security establishments of the UK and the USA - and the "terrorism experts" who inform them and wheedle billions of dollars out of them for bomb puffers and face recognition gizmos and remote gait analyzers and similar hi-tech phrenology gear - have bought the Hollywood binary liquid explosive myth, and have even acted upon it.

We've given extraordinary credit to a collection of jihadist wannabes with an exceptionally poor grasp of the mechanics of attacking a plane, whose only hope of success would have been a pure accident. They would have had to succeed in spite of their own ignorance and incompetence, and in spite of being under police surveillance for a year.

But the Hollywood myth of binary liquid explosives now moves governments and drives public policy. We have reacted to a movie plot. Liquids are now banned in aircraft cabins (while crystalline white powders would be banned instead, if anyone in charge were serious about security). Nearly everything must now go into the hold, where adequate amounts of explosives can easily be detonated from the cabin with cell phones, which are generally not banned.

Action heroes

The al-Qaeda franchise will pour forth its bowl of pestilence and death. We know this because we've watched it countless times on TV and in the movies, just as our officials have done. Based on their behavior, it's reasonable to suspect that everything John Reid and Michael Chertoff know about counterterrorism, they learned watching the likes of Bruce Willis, Jean-Claude Van Damme, Vin Diesel, and The Rock (whose palpable homoerotic appeal it would be discourteous to emphasize).

It's a pity that our security rests in the hands of government officials who understand as little about terrorism as the Florida clowns who needed their informant to suggest attack scenarios, as the 21/7 London bombers who injured no one, as lunatic "shoe bomber" Richard Reid, as the Forest Gate nerve gas attackers who had no nerve gas, as the British nitwits who tried to acquire "red mercury," and as the recent binary liquid bomb attackers who had no binary liquid bombs.

For some *real* terror, picture twenty guys who understand op-sec, who are patient, realistic, clever, and willing to die, and who know what can be accomplished with a modest stash of dimethylmercury.

You won't hear about those fellows until it's too late. Our official protectors and deciders trumpet the fools they catch because they haven't got a handle on the people we should really be afraid of. They make policy based on foibles and follies, and Hollywood plots.

Meanwhile, the real thing draws ever closer. ®

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