

Forensics

Answer Key

The following is a true and complete report of the fictitious incident. Names have been changed to protect the innocent and the alter-egos of the now retired super heroes.

On February 11th, 2005, Flatman and Ribbon (concerns of copyright!) were paid a visit by a carrier pigeon with a note attached to his right foot, as opposed to the old bat signal in the sky (laser pointers outlawed in 2004). The note read: "Flatman, come quick! Arch-villains planning major coo attempt!" The note was signed by Commissioner Golden (more fear of copyright infringement!)

Flatman, Ribbon, Alfred (Flatman's personal auto mechanic) and the carrier pigeon all jumped in the 12 cylinder super-charged Flatmobile and headed for Gollum City. Arriving at City Hall, Chief O'Hara (generic enough to not worry about it) laid out the evidence.

Flatman, realizing he was way over his head on this one, called Aguaman, the Flask, and the Green Flashlight to assist in cracking this caper. Aguaman, still dripping from his swim in, quickly began pouring over the evidence:

- Fingerprints taken from the note (Exhibit #1)
- Finger prints taken from the steering wheel (Exhibit #2)
- Fingerprints taken from the trunk lid of the car (Exhibit #3)
- An torn and crumpled unsigned note assumed to have been written by the ring leader, found in the abandoned car outside Police Headquarters that read "*We need to get together and raise...*" (Flatman sent it to the chromatography lab) (Exhibit #4)
- A small piece of fabric hooked to the driver's side interior door handle, possibly torn from some clothing during a hasty exit (Exhibit #5) (**Wool**)
- 5 small plastic pieces of plastic on the floor of the driver's seat (Exhibit #6) (**LDPE SG=0.93**)
- A white powder found on the passenger seat of the car (Exhibit #7) (**Lithium Chloride**)
- A powder found on the floor of the trunk (Exhibit #8) (**MgSO4**)
- A powder found on the outside of the trunk (Exhibit #9) (**NH4Cl**)
- A powder found on the floor of the rear seat behind the driver (Exhibit #10) (**Sodium Acetate**)
- A powder found on the floor behind the passenger seat (Exhibit # 11) (**Potassium Chloride**)
- A powder found on the floor of the driver's seat (Exhibit #12) (**Sodium Acetate**)
- Some plastic pieces found on the seal behind the Passenger's seat (Exhibit #13) (**PETE SG=1.3 to 1.4**)
- Some plastic pieces found on the seat behind the driver (Exhibit #14) (**PS SG= 1.05**)

The next day, Flatman took the evidence to the Police Forensics Lab for further analysis. Ironically, the lab found that every piece of evidence had a similar film of a substance over it. This was collected and bagged (Exhibit #15) (**Sodium Chloride**).

Ribbon, The Boy Wonder, sent all of the polymers to he buddy in the Plastics Lab, Reece Ickle. Unfortunately, because Ribbon has spent so many years fighting crime, he missed several spelling classes and placed the polymers in the Recycle bin instead. They were recovered, but compressed into pellets. Only the very best CSI agents will be able to identify these.

The mighty, somewhat out of shape Crime fighters then waddled into action, rounding up the following Suspects:

The Penguin-Since retiring, the penguin has opened a deli on 4th street. He specializes in “unique” foods such as goat burgers (**Calcium Sulfate**) on homemade buns (**Cornstarch**) and red wines (**NaH₂PO₄**). In recent years the Penguin had lost considerable weight due to his recently discovered Potassium deficiency, but it now seems under control (**Potassium Chloride**) as he has returned to his pompous self. When brought in for questioning, he was dressed in a cotton shirt and had a pen in his pants pocket and his eyeglasses in the other pocket with one lens missing. (**PETE SG = 1.3 to 1.4**) Fingerprints were taken for comparison.

The Joker- The Joker has maintained an active lifestyle by working at the local airport directing arriving and departing flights on the tarmac (**Sodium Acetate**). Although he has had some health issues in recent years, being prone to seizures, he is in the best physical condition of the group,. He saw a Home Health Care Specialist for his seizures, who recommended taking small doses of Epsom Salts daily (**Magnesium Sulfate**). This seems to have his seizures under control. He refuses to eat at “The Penguin Palace” due to what he feels are unsanitary conditions, and the fact that he is on a restricted diet, being a diabetic (**Glucose**). When picked up, he was wearing a wool sport coat with a pen in the inside pocket. In the rear pocket of his pants were plastic shards resembling the cone of a flashlight used to direct jets. (**PS SG = 1.05**) Fingerprints were taken for comparison.

The Riddler- The Riddler says he has given up the life of crime and taken up an honest days work as an exterminator (**Boric Acid**). In fact, he is the Penguin’s best customer. Every time he treats the deli for roaches, he grabs lunch there. The Riddle has always been a “Type A” personality and recently has been prescribed drugs to help level his up and down moods. (**Lithium Chloride**) In addition to this, he has been battling a stomach ulcer, no doubt triggered by eating at the Palace. (**Calcium Carbonate, Sodium Carbonate**) Because of this, he always carries a ½ gallon of milk (**HDPE SG = 0.96**) to wash down the medicine. When he was picked up he was still wearing his green spandex (**Polyester**) body suit with black question marks. (He was picked up in Central Park, so he fit right in). He had a pen in his... well, he had a pen. Fingerprints were taken for comparison.

Mr. Freeze- Mr. Freeze also states that he is no longer involved in a life of crime. Now he is actively involved in Politics (go figure!), after doing a brief stint in the movies. He spends his spare time gardening in his back yard (**Calcium Nitrate**) and weight lifting. He has also gotten into photography and develops all of his own pictures. (**Ammonium Chloride**) He has recently bought a fixer upper and is installing a darkroom, complete with running water. (**PVC**). He took great pride in showing the Officers the concrete foundation he poured. (**Calcium Carbonate**). Of course he was wearing a polyester leisure suite, and never goes anywhere without a pen and never passes up an opportunity to sign autographs. In his pants pocket was an empty sandwich bag from lunch (**LDPE SG = 0.90 to 0.93**).

Oh, in case you were wondering what the charges are, the abandoned vehicle did not have a current vehicle emissions tag in the windshield. In fact, when the VIN number was run through the Gollum City computer, it showed that it had been tested earlier that month and had failed the inspection. No names were released.

Each of these villains have shown leadership qualities over the years, flawed as they may be. For this reason, all of the above would prefer to drive, as opposed to ride in the car.



The Penguin



The Joker



The Riddler



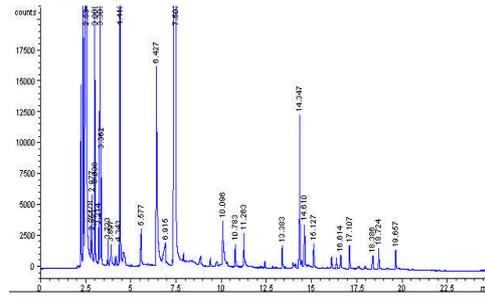
Mr. Freeze

SECTION

1: Fingerprints (10 points possible)

CAUTION: There may be more than one matching print within the prints collected! There also may have been unknown prints collected from the various scenes that have no bearing on the case. At the time of collection, the CSI agents did not have prints to compare to, so they collected all prints found.

- | | | | |
|----|---|-------|--|
| 1 | Whose fingerprints were found on the note?
(Exhibit #1) | _____ | Joker's and
The
Riddler's |
| 2 | Whose fingerprints were found on the steering
wheel? (Exhibit #2) | _____ | The Joker
& Mr.
Freeze |
| 3 | Whose fingerprints were found on the trunk lid?
(Exhibit #3) | _____ | The Joker
and Mr.
Freeze |
| 4. | Identify the following: | | |
| | A Percent of population with Looped Prints | _____ | 65% |
| | B. Percent on Population with Arched Prints | _____ | 5% |
| | C Percent of population with Whirled Prints | _____ | 30% |
| 5 | How many ridges does the average
fingerprint contain? | _____ | 150 |
| 6 | How many comparative points are required
for a "positive ID? (Give me a range, if you
want) | _____ | 8 to 16 |
| 7 | What Does "AFIS" stand for, as it relates to
fingerprints? | _____ | "Automatic
Fingerprint
Identification
System" |



SECTION 2: Chromotography

Suspects Emissions

Chromatography

(15 Points possible)

(Teams may use Isopropyl Alcohol and / or Water as a solvent)

8 Whose pen(s) could have been used to write the _____ note, based on Chromatography?

The Riddler & Mr. Freeze had identical pens

9 Compare the suspect gas chromo at the top of the page with the previous page. What was the Vehicle Identification Number (VIN) of the suspects car _____

VIN #367592358187

SECTION 3: Chemistry (40 Points Possible)

10 What type of fabric was found on the car door? (Exhibit #5) _____

Wool

11 What type of polymer was found on the floor of the front seat? (Exhibit #6) _____

LDPE (SG=.90 to .93)

12 What type of powder was found in the passenger's seat? (Exhibit #7) _____

Lithium Chloride

13 What type of powder was found IN the trunk? (Exhibit #8) _____

Magnesium Sulfate

14 What type of powder was found on the OUTSIDE of the trunk? (Exhibit #9) _____

Calcium Carbonate

15 What type of powder was found on the floor of the seat behind the driver's seat? (Exhibit #10) _____

Sodium Acetate

16 What type of powder was found on the floor behind the passenger seat? (Exhibit #11) _____

Potassium Chloride

17 What powder was found on the floor of the driver's seat? (Exhibit 12) _____

Sodium Acetate

- | | | |
|--|-------|--|
| 18 What polymer was found on the seat behind the passenger (Exhibit #13) | _____ | <i>PETE</i>
<i>(SG=1.3 to 1.4)</i> |
| 19 What Polymer was found on the seat behind the driver (Exhibit #14) | _____ | <i>PS</i>
<i>(SG=1.05)</i> |
| 20 What type of powder was found by the lab? (Exhibit #15) | _____ | <i>Sodium Chloride</i> |

SECTION 4: Analytical Thinking (2 Points Each)

Assuming that all 4 suspects headed for the car at the same time, from the same location, identify the following:

- | | | |
|---|-------|--------------------|
| 18 Who first sat in the Driver's Seat? | _____ | The Joker |
| 19 Who was the last to sit in the Driver's Seat? | _____ | Mr. Freeze |
| 20 Who sat in the front passenger's seat? | _____ | The Riddler |
| 21 Who sat in the rear behind the passenger? | _____ | The Penguin |
| 22 Who ended up in the rear seat behind the Driver? | _____ | The Joker |
| 23 Who got in the car first? | _____ | The Joker |
| 24 Who got in the car second? | _____ | The Riddler |
| 25 Who got in the car third? | _____ | The Penguin |
| 26 Who was the last to get in the car? | _____ | The Joker |
| 27 Who put something in the trunk? | _____ | The Joker |
| 28 Who actually wrote the note? | _____ | The Riddler |
| 29 Who lost their copy of the note? | _____ | The Joker |
| 30 Who do you believe owned the Car? | _____ | The Joker |

25. Questions 18 through 30 could potentially have more than one correct answer. By providing a solid logic path within your essay, you may receive additional points even if your conclusions don't match those intended.

ESSAY ANALYSIS (10 Points Possible):

One Logic Path might be:

All 4 headed for the car at the same time. **The Joker was in the best physical shape, so he probably got there first.** It appears that the **Joker had the keys since Magnesium Sulfate, his seizure medicine, was found inside the trunk. This is further indicated by the presence of Sodium Acetate on the driver's floor, a deicing agent used at airports. This would indicate that he owned the car.** If the car was locked, he would have had to unlock it. Master criminals are normally not polite, so it is unlikely he would have opened another's door first. If the car was unlocked, he would have probably made it to the car first and claimed the Drivers seat first because he likes to drive. Fingerprints indicated that he has driven this car before, but do not indicate when. The wool fabric found on the driver's door may indicate that he was **forcibly removed from the driver's seat, and the LDPE found on the drivers floor, used in sandwich bags, could indicate that Mr. Freeze did the removing, since he had sandwich bags in his pocket.** In addition, the powder found on the trunk, **Calcium Carbonate, could be tied to Freeze as well, since he poured his concrete foundation which contains CaCO₃ and may indicate that the scuffle actually began at the trunk. Mr. Freeze is a large man, likes to drive, and works out often.** He is obviously capable of this physical removal.

The Riddler would have entered the car second, claiming the front passenger seat. Human nature dictates that he would choose a front seat over a rear seat, not wanting to allow anyone an "Alpha" role. **The Riddler can be placed there by the Lithium Chloride that he is taking for his by-polar problem.**

The third to enter was probably the Penguin. Since he has gained his weight back, he probably moves pretty slow. He sat behind the passenger in the rear. We know this **because Potassium Chloride was found there which he uses for his Potassium deficiency, along with the PETE used to make the lenses to his glasses that were found broken.**

Sodium Acetate was found on the floor behind the driver's seat, and PS from his broken flashlight was found on the seat behind the driver, indicating that, once removed from the driver's seat, the Joker ended up behind the driver. This was probably the last seat occupied, since it had the least amount of foot room. The driver, Mr. Freeze, is a very large man, and assumably moved the seat all the way back.

Although the Joker was actually the first to be seated in the car, he was also the last, since Mr. Freeze forcibly threw him from the driver's seat. The amount of time required for Mr. Freeze to remove the Joker, allowed the Penguin the time needed to claim the third seat. Quite possibly, the reason Mr. Freeze was late getting to the car to begin with, was that he stopped to sign autographs.

Although the Polymers help place the suspects in the vehicle, the evidentiary chain was broken by sending them to the recycle center, so they would not be admissible in court.

As for the note, it was actually taken out of context by Commissioner Golden. It was simply meant to be an invitation to a reunion of sorts between the four suspects. The Riddler wrote it because a pen like his was used and his fingerprints were found on it. **Mr. Freeze also had a pen like the one used, but his prints were not on the note, eliminating him from the writing it.** This note was sent to the remaining three suspects, but the **Joker's prints were the only other suspect prints on it.** Therefore, the Joker had to be the one that lost the note.

In case you were wondering, the Note Actually Read: *"We need to get together and raise our glasses to times gone past"*

Sample #15, the dusting found on all of the evidence, was obviously **Sodium Chloride, sea salt from where Aguaman "poured" over the evidence while still dripping wet, which dried to salt film!**