



## Advancement of Chemical Technique used in Bribe Trap Cases

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### Abstract

In India ways of corruption are blocked by use of vast variety of chemical based trapping methods or techniques, which involves the use of fluorescent dyes, starch powder and phenolphthalein powder, but the chemical of choice is phenolphthalein powder because it is most common, colorless, easily available and its chemistry is favorable for trapping method because it is weak acid and in unionized form it is colorless and sign of changing of colorless mode to pink indicate its ionization. Persistence of pink color during court proceedings is the major issue because, because when the court asked for proof regarding transfer of phenolphthalein and its identification, so concerning to the chemistry of phenolphthalein the pink color in ionized form is persistent for longer period if phenolphthalein is combined with hydroquinone, as well as this technique blocks the way of criminal's plea regarding the use of laxative. So the color persistency for court trials as well as no way outs for culprit, these problems can be vanished and color of phenolphthalein can be maintained for a long period time with the help of hydroquinone.

**Keyword:** Trap case, laxative material and phenolphthalein.

### Introduction

Chemical and advanced digital method of crime trap and case study is an authentic area in a field of forensic chemistry and forensic photography and is certain to draw interest of forensic student and also those who are professionally linked with legal services this study will serve purpose of undergraduate and postgraduate science<sup>1</sup>. It is an attempt to introduce the conception of principle of practice of trapping method by chemicals Law enforcement agency and defense is protective wall compound for all complainants, with due respect to complainant innocence, law enforcement agency guide about how to carry phenolphthalein in contact with currency which asked as bribe by culprit.

If he keeps these currencies in his bags or pocket etc, chemical is also transferred to such object (*Principle of Locard exchange*). Confirmative proof is obtained when traces of phenolphthalein which are transferred to accused are collected and washed with sodium carbonate, gives pink colored solution, so collecting that washings sent to forensic science laboratories for further analysis. After all the instrumental analysis confirmative assessment it can be considered as important evidence in court trials<sup>2</sup>.

Although number of technique are available such as fluorescent dye, starch powder, phenolphthalein, but phenolphthalein powder are remained most popular in India in anticorruption department. As if we focused upon chemistry of phenolphthalein and its appearance both in ionized and unionized form it provide a good differentiating values of color like in ionized state it forms pink color and in unionized

state it reflects its colorlessness, as principal of *Locard exchange* the applied amount of phenolphthalein on currency are obviously come in contact with culprit and his pocket. So many conventional and instrumental techniques are involved like U.V., thin layer chromatography, high performance thin layer chromatography etc. for confirmation of phenolphthalein. Phenolphthalein methods are mostly used in anticorruption departments cases. As we discuss about the legal framework and law society rules as well as law and order are mainly based upon 4 main pillars, like Constitution of India 1950, The Code of Criminal Procedure 1973, and Procedure of Human Right act 1993 and Indian evidence act 1972, as well as police act and operation through video range of statutory law of constitution<sup>3,4</sup>.

**Trap case:** Every acceptance illegal gratification whether preceded by demand, would cover by prevention of corruption Act 1988 with punishment is 6 month to 7 year with fine<sup>5-7</sup>.

**To start the case:** i. A complaint is required. ii. A complaint is verified. iii. The actual incidence i.e. acceptance of money is take place in presence of independent witness.

**What amounts to a bribe case?:** Fraud cases: the complainant is department. Disproportionate asset case: Information obtained by general observation either from way of living of a person, or by general survey for nation by raids. (No arrest in such a cases). Trap case: complainant is a person who grudges you All these come under prevention of corruption act 1988<sup>8</sup>.

## Material and Methods

**Chemical technique:** Trap case involve use of various chemicals which are called tracing materials. Staining material, Fluorescent powder, Chemical detector, Radioactive indicator.

**Staining method:** In this method a powdery substance is employed which on touch will be converted to dye due to moisture, depending upon the color and appearance it is indefinable to the culprit who comes in contact with related object or currency. Phenolphthalein powder are most common in India for investigation of anticorruption case, In staining method behavior of phenolphthalein matters, as I discussed before in general, all weak acids particularly phenolphthalein in its unionized form reflects colorless appearance and in ionized state displays pink color and the scientific reason behind changes in color according to its physical state is just because of increase and decrease of concentration of  $H^+$  and  $OH^-$  common ions, we can do experiments with changing color of phenolphthalein by suppressing the dissociation of phenolphthalein by increase in  $H^+$  ion concentration and enhancing the dissociation of phenolphthalein by decrease in concentration of  $OH^-$  ion by addition of bases like KOH and NaOH<sup>9</sup>.

**Methodology: Thin layer chromatography:** collected sodium carbonate washing are extracted in solvent ether and ether extract was spotted upon TLC using silica gel plate exposed to ammonia vapor or iodine fumes for visual development of unrecompensed phenolphthalein pink spot.

**Mobile phase: Chloroform: acetone**

4 : 1

**System for stationary phase = silica gel G**

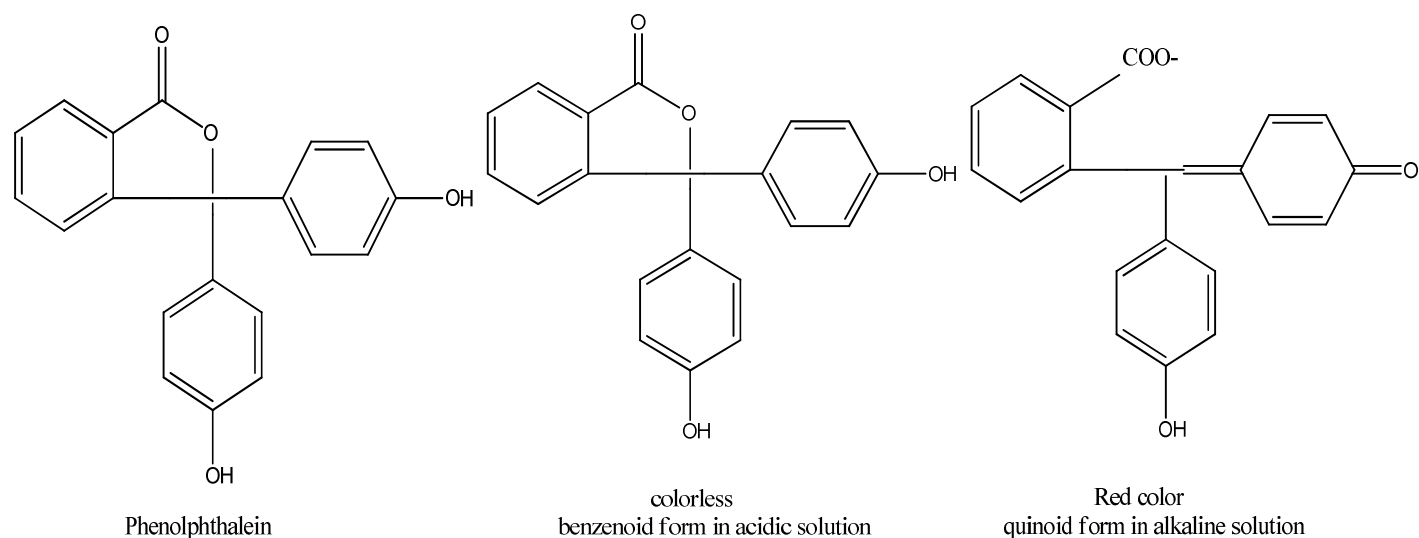
**Observation under = U.V.**

**Barriers in phenolphthalein trap cases:** The main probable problem in trapping operation occur due to fading of color after some time slots and loose its evidential values which actually court wants.

Disappearance of color is due to, i. Imbalance of p H of solution of phenolphthalein. ii. Degradation of phenolphthalein solution.

In first case maintaining the balance of phenolphthalein by addition of acid and base is the way to get rid off of from first reason for color fade.

sometime fading of color by degradation of phenolphthalein in alkali condition into phenol and benzoic acid and interference of  $O_2$  is result in degradation of phenolphthalein in alkaline medium, this pink color is made persistent for month to year by giving phenolphthalein for trapping operation to complainant should be mixed with hydroquinone, because it displays dual benefit, like presence of hydroquinone may make color persistent or period of time, as well as it blocks the way of breaking down of phenolphthalein from its original form to phenol and benzoic acid, so If culprit have the plea that he is been user of phenolphthalein tablet since long period due to his health problem. The presence hydroquinone is important factor because laxative remedies do not contain the hydroquinone.



**Figure-1**  
Showing behavior of phenolphthalein



**Figure-2**  
**Phenolphthalein Powder**



**Figure-4**  
**Disappearance of color on addition of alkali**



**Figure-3**  
**Phenolphthalein Hand wash**



**Figure-5**  
**TLC plate of ether extract**



**Figure-6**  
Visualization of TLC under U.V. Light source



**Figure-7**  
Showing the pink spot of phenolphthalein with hydroquinone combination

## Results and Discussion

The pink color of phenolphthalein solution is maintained while giving phenolphthalein for trapping operation to complainant should be mixed with hydroquinone, because it displays dual benefit, like presence of hydroquinone makes color persistent for maximum period of time slots like from month to several year, also create obstacle in the way of breaking of phenolphthalein to phenol and benzoic acid. Defense always take the advantage of this situation, but this can be overcome by adding small amount of hydroquinone as well as This problem can be vanished and color of phenolphthalein can be maintained for a long period time with the help of hydroquinone, as well as this technique vanish the chances of criminal's plea regarding the use of cathartic and aperients material.

All Thin layer chromatography plate were examined in ultraviolet light sources a pink colored spot is clearly seen which is positive result of presence of phenolphthalein chemical because such kind of spot only expected in phenolphthalein with hydroquinone to come.

## Conclusion

The alkali phenolphthalein solution is well maintained often for several month to year with combination with hydroquinone.

otherwise color may changed after sometime, and hence defense often take the advantage but this can be overcome by adding small amount of hydroquinone, depending upon the case processment it can't be guaranteed for longest period of time duration.

Modern technique of traps like photographic instruments, mikes, undercover operation by volunteers is useful, full proof and having no loophole to escape out the criminal, and also reliability is more as compared to chemical based technique.

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