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Abstract
Latex gloves are notoriously difficult substrates for developing latent prints due to varying degrees of texture, fit and many other variables. This experiment compared three commonly used development techniques, cyanoacrylate fuming with magnetic powder, ninhydrin, and black gellers, to determine which produced the best results. Samples were processed after being stored for varying amounts of time to determine whether or not time affected the quality of the results. Results indicate that the cyanoacrylate and the gellifer techniques produce comparable results, with the gellifer producing a slightly higher percentage of identifiable prints. The ninhydrin technique produced no identifiable print. Additionally, the amount of time the gloves were allowed to sit did not appear to affect the quality of the results.

Introduction
In the past it has been difficult to develop latent prints on latex gloves and two of the more common techniques, ninhydrin and cyanoacrylate (CA) fuming, don’t always provide results of good quality consistently. Since labs often have limited funding, resources, and time, it is important to find a simple, cost-effective and effective technique for developing latent prints on latex gloves. A newly proposed technique of using black gellers has given good results in a recent study by Velders (2004) and requires very little processing and time. This current project compared ninhydrin and CA with magnetic powder to the more recently proposed method of using black gel Lifters to develop latent prints on latex. The project also aimed to determine whether time was a factor in the quality of the results and the methods tested were chosen to test on latex gloves samples which were previously stored for varying amounts of time. This experiment helped to shed light on the most effective method for developing latent prints on latex gloves as well as the effect of time on results.

Materials and Methods
Sample Collection
- A rating system was developed using test prints which was then used to rate any prints that were developed during research.
- Participants wore size medium powder free latex exam gloves for 15 minutes, with a period of at least 15 minutes before wearing the next pair of gloves.
- While on the hands, the tips of the fingers were outlined surrounding the primary part of the fingerprint region.
- Gloves were removed by peeling off the cuff at a moderate slow and relaxed speed and a circle was drawn in the middle of the palm region on the now inverted glove where a print was then laid down.
- Gloves were separated into 8 different age groups: 1 day, 3 days, 1 week, 2 weeks, 3 weeks, 4 weeks, 5 weeks, and 6 weeks.
- Gloves were stored in cardboard boxes at room temperature until processed.

Table 1: Rating Scale for Cyanoacrylate, Ninhydrin and Gel Lab Techniques Including Score, Description and Examples

Table 2: Score Distribution and Percentage of Identifiable Prints for each Method

Results
Cyanoacrylate with magnetic powder and the gellifer methods seemed equally effective at developing latent prints on latex gloves. However, the gellifiers captured more prints with 3rd level detail which would make it more ideal. Ninhydrin proved to be quite unsuccessful at developing latent prints and is not recommended for use on latex gloves. Further research should be done to optimize other methods for use with latex gloves such as comparing powders, dyes and alternative light sources after cyanoacrylate fuming, or by focusing on the different degrees of texture to see if any methods work well on gloves which are more textured.

Discussion
- Gellifiers and CA produced comparable results in both areas.
- Ninhydrin produced no identifiable prints and consistently produced less ridge detail throughout the entire experiment.
- Ninhydrin also produced significant background staining of the glove which is not recommended for use on latex gloves.
- The gellifiers yielded more prints with a score of 3, and given that the CA and gellifer methods appear to be equal in their ability to develop prints on latex gloves, the fact that the gellifer produces more clear detail could give it an edge.
- Time does not appear to affect the quality of results as prints with a score of 3 were present all the way up through 6 weeks.
- The biggest factor in the quality of results obtained was the fit of the glove

Conclusion
Cyanoacrylate with magnetic powder and the gellifer methods seemed equally effective at developing latent prints on latex gloves. However, the gellifiers captured more prints with 3rd level detail which would make it more ideal. Ninhydrin proved to be quite unsuccessful at developing latent prints and is not recommended for use on latex gloves. Further research should be done to optimize other methods for use with latex gloves such as comparing powders, dyes and alternative light sources after cyanoacrylate fuming, or by focusing on the different degrees of texture to see if any methods work well on gloves which are more textured.

References

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