# Production of CFH Filter Using Discarded Chicken Feather and Cotton Fabric

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The development of human activity and industry has led to various environmental pollution. One of the biggest problem is chicken feather waste created during food processing. Another problem is that 99% of discarded cotton fabrics becomes buried or incinerated causing high level of soil, water, and air pollution. In this study, a CFH filter (Chicken Feather-based Heavy metal water filter) was proposed to reduce the pollution caused by the two wastes above as well as heavy metal contamination. Chicken feather contains a remarkable level of keratin, which is mainly consisted of cysteine. When cysteine forms a dimer, disulfide bridge is formed between two cysteine. After reforming disulfide bridges into sulfonic acids through a certain process, the filter was made using the reformed feather and cotton fabrics. The results of the experiment confirmed that the lab scale CFH filter shows a significant heavy metal removal efficiency. The full scale filter for real-world application is expected to show a better performance. Also, using bacteria, the used CFH filter could be thoroughly degraded, and the adsorbed heavy metal could be completely isolated in a controllable environment. The CFH filter can be a simultaneous solution to feather and cotton waste disposal. Furthermore, through practical application, it will be an appropriate technique to reduce heavy metal contamination.

**Awards Won:**
Fourth Award of $500