

제 목	국 문	PVC 여과지에 채취된 MWF가 공기접촉과 건조과정에서 생긴 손실에 관한 연구	
	영 문	Loss of Metalworking Fluids Collected on PVC Filter Due to Contact Air and Desiccation	
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진행 상황	연구완료 (0), 연구중 () → 완료 예정 시기 : 년 월		
<p>1. 연구목적</p> <p>The purpose of this study was to examine whether the loss of MWF mist collected on PVC filters occurs not only through the passing of clean air, but also through the filter desiccation that follows air sampling. In addition, we determined the factors significantly affecting the loss of MWF mist collected on PVC filters.</p> <p>2. 연구방법</p> <p>Four types of metalworking fluids (MWF) were used to evaluate the potential for the loss of MWF mass from filters. Two methods were used to study the stability of MWF mass on filter media. The first was to spike known amounts of MWF onto polyvinyl chloride (PVC) filters, store the filters over silica gel desiccant, and take repeated gravimetric measurements of the filters at intervals (1, 2 and 3 days). A MWF aerosol mist was generated in a test chamber and collected on PVC filters for the second experimental method. Additional clean air was drawn through a subset of filters (range 0.02 - 0.48 m3) which were then stored over silica gel prior to weighing.</p> <p>3. 연구결과</p> <p>The loss of MWF mass from the spiked filters due to desiccation ranged from 2.0 % to 16.1 % and increased with desiccation day. The MWF aerosol mass collected on PVC filters decreased with increasing volume of clean air passing through the filter. MWF lost after 10 minutes (0.02 m3) ranged from 12.4 % to 21.8 % of the original loading mass. A multiple regression model was constructed; loading mass, fresh MWF (reference age; used MWF), and air passing time of 10</p>			

There was no multicollinearity among the predictor variables (all VIF values < 5 , all tolerances < 0.2). All Cooks distances were < 1 , indicating that there were no outliers in these models. Minutes (reference time; 240 minutes) were significantly related to the loss of collected MWF due to desiccation ($p=0.0001$, $R^2=0.374$).

4. 고찰

Although the losses due to desiccation were considerably lower than those due to the air passing through the PVC filter (Table 3), our findings suggest that MWF mass could be lost during shipment, storage and desiccation. Evaporation of MWF mist from filters may depend on fluid characteristics such as size distribution, composition and other physical properties and on sampling conditions. Further study is needed to examine if MWF mist with diverse characteristics, collected in a real sampling situation, exhibits loss of mass due to evaporation.

5. 결론

Our findings suggest that MWF aerosol collected on PVC filters may be lost to evaporation due to not only the passage of clean air through PVC filter, but also under conditions of shipment, storage, and desiccation of sample filters without active airflow. Further study is needed to examine the effect of sample collection, shipment and storage in real sampling situations to assess the extent of loss of MWF mass from sample filters.