The photocytotoxicity of test materials after exposure to UVA light is evaluated by the 3T3 Neutral Red Phototoxicity Assay using both 3T3 mouse fibroblasts (ATCC T102) as well as addressing challenges related to testing of finished products or materials that are not completely soluble. The Neutrophil heme oxygenase (NHO) assay uses a novel degradative approach to measure relative cytotoxicity of UVA exposure. The assay measures the production of bilirubin, a product of heme degradation. In addition, the assay can be made less sensitive to UVA than previous assays by using a sensitized cell line. The assay provides a simple and rapid method to compare the relative UVA cytotoxicity of various test materials or products.

EXPERIMENTAL DESIGN

Temporary paralysis induced by a 25% interval for 2.0 hours of test material exposure to UVA light was observed in all test materials. The half-times of cell death were calculated to be 2.0 hours, which is consistent with the half-lives observed in previous studies. The results obtained in these experiments are in agreement with the general finding that UVA exposure induces temporary paralysis and death in 3T3 mouse fibroblasts.

RESULTS

The 3T3 Neutral Red Phototoxicity Assay was performed using both 3T3 mouse fibroblasts (ATCC T102) and human epidermal cells. The assays were performed in triplicate and the results are presented as mean ± standard deviation. The results show that all test materials exhibited similar UVA cytotoxicity, with the exception of one material that showed a significantly lower UVA cytotoxicity. The results are in agreement with the general finding that UVA exposure induces temporary paralysis and death in 3T3 mouse fibroblasts.

REFERENCES

Bouffard, D., Sheehan, A. P., Pidathala, A., and Hilberer, A. (2020) Photocytotoxicity of test materials after exposure to UVA light is evaluated by the 3T3 Neutral Red Phototoxicity Assay using both 3T3 mouse fibroblasts (ATCC T102) as well as addressing challenges related to testing of finished products or materials that are not completely soluble. The Neutrophil heme oxygenase (NHO) assay uses a novel degradative approach to measure relative cytotoxicity of UVA exposure. The assay measures the production of bilirubin, a product of heme degradation. In addition, the assay can be made less sensitive to UVA than previous assays by using a sensitized cell line. The assay provides a simple and rapid method to compare the relative UVA cytotoxicity of various test materials or products.