

FINDING OF NO SIGNIFICANT IMPACT
FOR

Food Additive Petition 6B4503, submitted by Johnson Matthey Chemicals, to amend the food additive regulations in § 175.320 *Resinous and polymeric coatings for polyolefin films* (21 CFR 175.320) to provide for the safe use of silver chloride-coated titanium dioxide as a preservative in polymeric coatings for polyolefin films intended for use in contact with food.

The Environmental Impact Staff, Center for Food Safety and Applied Nutrition, has determined that the approval of this petition will not significantly affect the quality of the human environment and therefore will not require the preparation of an environmental impact statement. This finding is based on information submitted by the petitioner in an environmental assessment prepared using the format described in 21 CFR 25.31a(b)(1) and on the following analysis:

1. The amounts of silver, titanium, and chloride introduced into the environment from the landfill disposal of food-packaging material containing the preservative are expected to be a very small fraction of the amount present in the projected market volume of the preservative. This finding is based on EPA's regulations governing municipal solid waste landfills.¹
2. We have considered the potential for the silver and titanium to enter the environment following disposal by incineration of food-packaging materials containing the subject preservative. We believe such introduction to be insignificant based on the following discussion:

The behavior of metals, including silver and titanium, in municipal waste combustors^{2,3,4,5} and in coal-fired power plants^{6,7} has been described. Combustor ash is

¹EPA's regulations require new municipal solid waste landfill units and lateral expansions of existing units to have composite liners and leachate collection systems to prevent leachate from entering ground and surface water and to have groundwater monitoring systems (40 CFR Part 258). Although owners and operators of existing active municipal solid waste landfills that were constructed before October 9, 1993, are not required to retrofit liners and leachate collection systems, they are required to monitor groundwater and to take corrective action as appropriate.

²*Characterization of MWC Ashes and Leachates from MSW Landfills, Monofills, and Co-disposal Sites*, 1987, EPA 530-SW-87-028A, United States Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, DC 20460.

³Eighmy, T.T., J.D. Eusden, Jr., J.E. Krzanowski, D.S. Domingo, D. Stampfli, J.R. Martin, and P.M. Erickson, "Comprehensive Approach Toward Understanding Element Speciation and Leaching Behavior in Municipal Solid Waste Incineration Electrostatic Precipitator Ash," *Environ. Sci. Technol.*, 1995, Vol. 29, No. 3, pages 629-

the solid material that forms during combustion and is collected in ash pits, called the bottom ash, plus the particulate matter, called the fly ash, that is mechanically entrained in the flue gas and removed from the flue gas by various devices.

The Environmental Protection Agency (EPA) has promulgated regulations limiting the amount of particulate matter that may be emitted by municipal waste combustors larger than 45 megagrams per day capacity (40 *CFR* Part 60, Subpart E, §60.52). Municipal waste combustors with capacities greater than 225 megagrams per day are subject to additional EPA regulations that, among other things Based on these studies, these elements are expected to become part of combustor ash. , limit the amount of particulate matter that may be emitted (40 *CFR* Part 60, Subpart Ca, §60.30a - §60.39a and Subpart Ea, §60.50a - §60.59a). EPA has recently (September 20, 1994, and February 3, 1995) proposed additional regulations for new and existing municipal waste combustors: 59 *FR* 48198, 59 *FR* 48228, and 60 *FR* 6666. To meet the limitations on emission of particulate matter, particulate matter collection devices are installed in municipal waste combustors across the path of the flue gas before the stack exit where the flue gas is discharged to the atmosphere. The fly ash thus collected can be combined with the bottom ash at the waste combustor facility for disposal in landfills, as is discussed by EPA.⁸

The levels of silver and titanium that may be present in incinerator ash as a result of approval of this petition were estimated as follows: Assuming that the market volume given in the EA for the subject preservative is uniformly spread throughout the municipal solid waste generated in the United States and assuming that there is no recycling of food-packaging containers containing the subject preservative, the amounts

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⁴Fernandez, M.A., L. Martinez, M. Segarra, J.C. Garcia, and F. Espiell, "Behavior of Heavy Metals in the Combustion Gases of Urban Waste Incinerators," *Environ. Sci. Technol.*, 1992, Vol. 26, No. 5, pages 1040-1047.

⁵Greenberg, R.R., W.H. Zoller, and G.E. Gordon, "Composition and Size Distributions of Particles Released in Refuse Incineration," *Environ. Sci. Technol.*, 1978, Vol. 12, No. 5, pages 566-573.

⁶Davison, R.L., D. F. S. Natusch, and J.R. Wallace, "Trace Elements in Fly Ash," *Environ. Sci. Technol.*, 1974, Vol. 8, No. 13, pages 1107-1113.

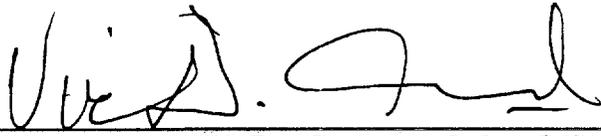
⁷Klein, D.H., A.W. Andren, J.A. Carter, J.F. Emery, C. Feldman, W. Fulkerson, W.S. Lyon, J.C. Ogle, Y. Talmi, R.I. van Hook, and N. Bolton, "Pathways of Thirty-Seven Trace Elements Through Coal-Fired Power Plant," *Environ. Sci. Technol.*, 1975, Vol. 9, No. 10, pages 973-979.

⁸Environmental Protection Agency, "Determination of Point at Which RCRA Subtitle C Jurisdiction Begins for Municipal Waste Combustion Ash at Waste-to-Energy Facilities," *Fed. Reg.*, 60, 6666, February 3, 1995.

of silver and titanium in incinerated solid waste expected to result from this action are estimated at about 11 kg/year for silver and 34 kg/year for titanium. These amounts, divided by the amount of combined ash generated annually by municipal waste combustors (8 million tons or 7.3×10^{12} g),⁸ yield estimates of 0.002 ppm silver and 0.005 ppm titanium that will be added to incinerator ash as a result of approval of this petition. These levels are at least four orders of magnitude below the levels of silver and titanium in incinerator ash before approval of this petition as given in Table 2-2 of the reference in footnote 2 which gives silver levels between 0.05 and 93.4 ppm and titanium levels between 1,000 and 28,000 ppm.

Based on the levels of silver and titanium estimated to be added to incinerator ash as a result of approval of this petition, we conclude that combustion of the food-packaging materials containing the subject preservative will not significantly affect levels of silver or titanium that might enter the environment from the disposal of incinerator ash.

3. Food-packaging materials containing the subject preservative will not contribute a significant amount of chloride to the incineration waste stream. Using the market volume given in the EA, we have calculated that disposal of the subject preservative will add 3.5 kg/year of chloride to waste destined for incinerators. According to EPA, 33 million tons (3.0×10^{13} g) of municipal solid waste are combusted annually in the U.S.,⁹ and chloride comprises 0.5% by weight of unprocessed waste destined for incinerators.⁹ This calculates to 1.5×10^{11} g of chloride that enter municipal waste combustors annually. Introduction of the subject preservative into the waste stream would increase the chloride level in waste destined for incinerators by only 0.023 ppm.

Prepared by: 
Vir D. Anand, Ph.D., Consumer Safety Officer
Indirect Additives Branch

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Approved by: 
Layla I. Batarseh, Environmental Toxicologist
Environmental Impact Staff

Date: August 29, 1996

⁹Municipal Waste Combustors - Background Information for Proposed Guidelines for Existing Facilities, EPA-450/3-89-27e, United States Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, NC 27711, Table 2.2-1, page 2-5.