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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
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OFFICE OF  
PREVENTION, PESTICIDES AND  
TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: Silver-Copper Zeolite Data Review  
DP Barcode: D194115  
ID No: 059824-00001

FROM: *for* Anthony F. Maciorowski, Chief  
Ecological Effects Branch  
Environmental Fate and Effects Division (7507C) *Douglas J. Hilday 2/15/94*

TO: John Lee, PM 31  
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Background

Kanebo has been trying to concurrently register their three zeolite products: silver (Ag), silver-copper (AgCu), and silver-zinc (AgZn) zeolite. To avoid confusion, below is a brief history of the AgCu zeolite requirements for EEB.

○In 1992 EEB reviewed the following five studies to support the registration of AgCu zeolite: 71-2 mallard duck LC<sub>50</sub> (MRID No. 416158-11); 71-2 bobwhite quail LC<sub>50</sub> (MRID No. 416158-12); 72-1 bluegill sunfish L<sub>50</sub> (MRID No. 416158-13); 72-1 Rainbow Trout LC<sub>50</sub> (MRID No. 416158-14); 72-2, *Daphnia magna* EC<sub>50</sub> (MRID No. 416158-15). None of the studies fulfilled the guideline requirements and it was noted that a bobwhite LD<sub>50</sub> and estuarine/marine testing were required.



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○In a submission that EEB reviewed in 1993, Kanebo made label modifications which eliminated the requirement for estuarine/marine testing.

Also in 1993, data was submitted that enabled EEB to upgrade the three aquatic studies to satisfy freshwater testing requirements. The studies indicated that AgCu zeolite is very highly toxic to aquatic invertebrates ( $EC_{50} = 0.60$  ppm), moderately toxic to warmwater fish ( $LC_{50} = 3.4$  ppm), and slightly toxic to coldwater fish ( $LC_{50} = 100$  ppm). Ag zeolite and AgZn zeolite were also shown to be very highly toxic to aquatic invertebrates ( $EC_{50}$ s = .0350 and .30 ppm, respectively).

Due to the lack of homogeneity in the feed mixture and/or difficulties in measuring, the avian  $LC_{50}$  could not be upgraded.

○In 1994, EEB reviewed the following bobwhite studies:

Campbell, S.M. and J.B. Beavers. 1993. Silver copper zeolite: An Acute Oral Toxicity Study with the Northern Bobwhite. Study performed by Wildlife International Ltd., Easton, Maryland. Laboratory Study No. 363-101. Submitted by Kanebo Zeolite, USA, Inc., New York, New York. EPA MRID No. 428710-01.

Campbell, S.M. and J.B. Beavers. 1993. Silver-zinc Zeolite: A Dietary  $LC_{50}$  Study with the Northern Bobwhite. Study performed by Wildlife International Ltd., Easton, Maryland. Laboratory Study NO. 363-102. Submitted by Kanebo Zeolite, USA, Inc., New York, New York. EPA MRID No. 428709-01.

Both studies are scientifically sound and meet the guideline requirements for testing with a formulated product. The  $LD_{50} > 2250$  mg/kg indicates that AgCu zeolite is practically nontoxic to quail on an acute basis. The  $LC_{50} > 5620$  ppm indicates that AgZn zeolite is practically nontoxic to quail on a subacute basis. The AgZn  $LD_{50}$  may be used to fulfill the requirement for the  $LC_{50}$  with AgCu.

Conclusions

The testing requirements for AgCu zeolite have been fulfilled. Any change in the use pattern may necessitate further testing. It should also be noted that since testing was performed with the formulated product, raising the concentration of either copper or silver may necessitate additional testing.

Testing for indoor use chemicals is required to provide information in case of a spill and for environmental hazards labeling. Risk assessments are not performed for indoor use chemicals.

A table displaying the status of the three zeolite compounds is attached. If there are any questions, please contact Heather Mansfield at 305-5064.