RMV. However, the FT chamber gave higher RR (and RMV) values than the FP chamber. Conducting a direct comparison with the Alexander et al RMV equation1 found that the majority of the data points presented gave RMV values lower than predicted and species specific RMV equation is necessary. *1 Alexander DJ et al. (2008). Inhal. Tox., 20, 1179-1189.*

2389 Effects of Repeated Inhalation Exposure of Fenbutatin Oxide Formulation on Wistar Rats

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In order to assess the hazard potential of air-borne Vendex 50 WP (Fenbutatin oxide), a widely used in agricultural pesticide, a repeated dose inhalation study in male and female Wistar rats was performed The rats were exposed to 0.002 mg a.i./L air (G2), 0.008 mg a.i./L air (G3), 0.016 mg a.i./L air (G4 and G6) for 6 hour/day, 5 day/week for 4 weeks respectively. A variety of biological clinical chemistry, hematology, urine analysis, organ weight, and histopathology were examined. In this study, treatment of Vendex 50 WP was associated with decreased prothrombin time and urine specific gravity and increases absolute and relative lung weights and urine volume and pH 0.008 mg a.i./L air (mid concentration) and 0.016 mg a.i./L air (high concentration). In the absence of any histopathological findings in organs associated with these findings, changes noticed were considered as an adaptive response to test item. Under the conditions of this study, the No Observed Adverse Effect Concentration (NOAEC) and No Observed Effect Concentration (NOEC) of Vendex 50 WP were 0.002 mg a.i./L air and 0.016 mg a.i./L air, respectively, when administered via inhalation following 20 exposure over a 28 days period.

2390 *In Vivo* Toxicological Assessment of Sanding Dust Generated from Micronized Copper Azole Pressure Treated Wood

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Micronized copper azole (MCA) is a pressure lumber treatment to prevent weathering and fungal infiltrations. In this study, the *in vivo* toxicity of sanding dust generated from MCA was compared to that of copper azole treated (CAC) or untreated yellow pine (UYP) wood to determine if the micronized copper was more bioactive. Particle matter ($PM_{2.5}$) was collected from sanding dust of each type of lumber and analyzed for metal content, using inductively coupled plasma mass spectrometry. MCA had a higher concentration of copper and generated smaller particles in comparison to CAC and UYP. Mice were exposed to three doses (28, 140, 280 µg) of UYP, MCA, or CAC, using pharyngeal aspiration. Lung damage and inflammation were examined 1 and 7 day post exposure, using bronchoalveolar lavage fluid (BALF) by measuring lactate dehydrogenase (LDH) activity and polymorphonuclear cells (PMNs). Results showed that LDH activity was significantly increased at 1 day post exposure for 280 µg of MCA and CAC compared to UYP. MCA and CAC caused a dose-dependent increase in PMNs. There were also dose-dependent increases in pro-inflammatory cytokines in with the BALF from the MCA and CAC exposed groups at 1 day post exposure. However, there were no significant changes seen at 7 day post exposure. Histopathological analysis was performed to examine mouse lungs at 1 and 84 day post exposure at 280 µg. Results showed that exposure to all three materials resulted in acute inflammation with infiltration of neutrophils and macrophages; and the pulmonary response was more severe in the MCA and the CAC groups, compared to the UYP at 1 day post exposure. Furthermore, MCA caused a more severe inflammatory response than CAC at 1 day post exposure. At 84 day post exposure, there were no significant changes observed in any exposure group compared to saline control. Taken together, these data suggest that µCAC and CAC are both more bioactive than UYP; and, moreover, MCA is slightly more toxic in comparison to CAC. [i] This report was prepared by CPSC and NIOSH staff; it has not been reviewed or approved by, and may not necessarily reflect the views of, the Commission.

2391 Inhalation of Gas Metal Arc-Stainless Steel Welding Fume Promotes Lung Tumorigenesis in A/J Mice

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Epidemiologic studies suggest an increased risk of lung cancer with exposure to welding fumes, but controlled animal studies are needed to support this association. Oropharyngeal aspiration of gas metal arc-stainless steel (GMA-SS) welding fume has been shown by our laboratory to promote lung tumor formation *in vivo* using a two-stage initiation-promotion model. Our objective in this study was to determine if GMA-SS fume also acts as a lung tumor promoter when delivered via inhalation to lung tumor susceptible mice. Male A/J mice received intraperitoneal (IP) injections of corn oil or the chemical initiator 3-methylcholanthrene (MCA;10 µg/g) and one week later were exposed by whole body inhalation to air or GMA-SS welding aerosols for 4 h/d x 4 d/w x 9 w at a target concentration of 40 mg/m^3. Lung nodules were enumerated at 30 weeks post-initiation. GMA-SS fume significantly promoted lung tumor multiplicity in A/J mice initiated with MCA (16.11 ± 1.18) compared to MCA/air-exposed mice (7.93 ± 0.82). Histopathological analysis found that the increased number of lung nodules in the MCA/GMA-SS group were hyperplasias and adenomas, which was consistent with developing lung tumorigenesis. Lung metal deposition analysis revealed that a markedly lower deposited dose (approximately 5 fold) elicited a similar fold-change lung tumorigenic response when compared to our previous aspiration study. In conclusion, this study demonstrates that inhalation of GMA-SS welding fume promotes lung tumor formation *in vivo* and provides further support for the epidemiologic studies that show welders are at an increased risk for lung cancer.

2392 Prenatal Exposure to Polycylic Aromatic Hydrocarbons Worsens Postnatal Hyperoxic Lung Injury: Implications for Bronchopulmonary Dysplasia in Premature Neonates

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Pregnant women are exposed to polycylic aromatic hydrocarbons (PAHs) through various environmental sources. Preterm neonates are exposed to supplemental oxygen (hyperoxia), and this in turn could lead to chronic lung disease/ bronchopulmonary dysplasia (BPD). We hypothesize that prenatal PAH exposure adversely affects fetal lung development and will exacerbate the effects of postnatal hyperoxia in newborn mice. We tested the hypothesis that prenatal administration of PAHs [a mixture of benzo(a)pyrene (BP) and benzo(b)fluoranthrene (BbF)], will differentially exacerbate lung injury and alveolar simplification in neonatal mice following postnatal hyperoxia, and that this effect will be altered in mice lacking the gene for *Cyp1a2* gene. Timed pregnant wild type (WT) (C57BL/6J) mice or mice lacking the gene for *Cyp1a2* were treated with a mixture of BP and BbF (total 15 mg/kg) orally or were given the vehicle corn oil (CO), once daily for 6 days on gestational days 14-19. The newborn mice born to these mothers were maintained in room air or exposed to hyperoxia (85% oxygen) for 14 days. Alveolarization and inflammation were analyzed. PAH-DNA and oxidative DNA adducts were measured in lungs of newborn mice exposed prenatally to PAHs, followed by postnatal hyperoxia or room air by ^{32}P-postlabeling. The lungs of newborn WT mice exposed prenatally to the vehicle control, followed by postnatal hyperoxia showed lung injury and inflammation, and alveolar simplification (as measured by mean linear intercept), compared to animals maintained in room air. WT mice that were prenatally treated with a mixture of BP and BbF, followed by postnatal hyperoxia showed potentiation of lung injury and abnormal alveolarization compared to those that were prenatally exposed to CO. The alveolar simplification was greater in *Cyp1a2*-null mice. PAH-DNA adducts were detected in neonatal lungs with maternal exposure to PAHs. Our results support the hypothesis that prenatal PAH exposure differentially exacerbate lung injury and alveolar simplification in neonatal mice following postnatal hyperoxia, and that this effect will be altered in mice lacking the gene for *Cyp1a2* gene. Our PAH-DNA adduct data provide evidence for existence of transplacental passage and genotoxic effects in the fetal mice. In summary, our findings suggest that premature infants born to women exposed to PAHs will have a higher risk to develop BPD.


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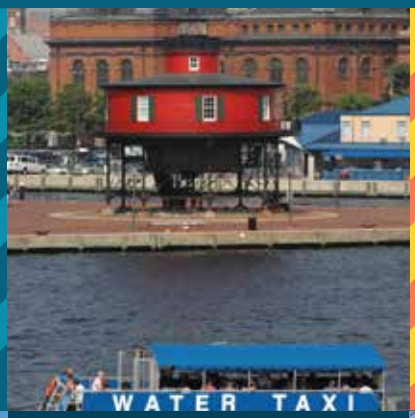

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