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Chemical Characterization of the Pyrotechnically Disseminated KM03 Red Phosphorus Floating Smoke Pot

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Abstract: The United States Marine Corps Floating Smoke Pot (FSP) MK 7 MOD 0 Program was established to redesign the previously fielded M4A2 Hexachioroethane (HC) Smoke Pot. Although the HC pots were extremely effective as an obscurant, there were safety concerns from a manufacturing and an operational perspective. Red phosphorous (RP) has been widely used in screening applications and was chosen as a replacement for the smoke payload. The smoke payload contained within the FSP MK 7 (KM03 pot) is a specific formulation that has been developed by Diehl BGT Defence GmbH and Co., KG (Uberlingen, Germany). Before an item is type classified, data must be collected and evaluated for the item's Health Hazard Assessment (HHA) and/or Life Cycle Environmental Assessment (LCEA). This is accomplished by performing chemical and environmental characterization of the disseminated smoke. The data suggest RP floating smoke pots do not create additional risks upon dissemination, and the products are generally found to be less hazardous than the HC smokes. Combustion products, inorganic anions and cations, particle size, volatile organic compounds, and aquatic toxicology were all evaluated. The greatest concern for the current replacement smokepot program would be the high levels of phosphine that were observed during long term storage.

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