Brief Summary:

The present disclosure includes methods and compositions of matter useful for mitigation and/or scavenging of H_2S.

In certain examples, the present disclosure includes methods for preparing an oil-soluble metal carboxylate. In certain examples, a carboxylate stream is reacted with a metal oxide. In still further examples, the carboxylate stream comprises C5-C9 carboxylic acids, C10 carboxylic acids, and/or C11+ carboxylic acids (carboxylic acids with 11 or more carbon atoms). In some examples, the C5-C9 carboxylic acids may comprise a C5 carboxylic acid, a C6 carboxylic acid, a C7 carboxylic acid, a C8 carboxylic acid, and/or a C9 carboxylic acid. In certain examples C5-C9 carboxylic acids may comprise about 0.1 percent by weight (wt. %) to about 1 percent by weight (wt. %) of the carboxylate stream. In some examples, C11+ carboxylic acids may comprise less than 10 percent by weight (wt. %) of the carboxylate stream such as about 5 percent by weight (wt. %) to about 10 percent by weight (wt. %), about 1 to about 10 wt. %, or about 1 to about 5 wt. % of the carboxylate stream. In still other examples, C10 carboxylic acids may comprise about 75 percent by weight (wt. %) to about 95 percent by weight (wt. %) of the carboxylate stream.

In an aspect, the present disclosure provides a method of preparing an oil-soluble metal carboxylate, comprising reacting a metal oxide with a carboxylate stream, wherein the carboxylate stream comprises C5-C9 carboxylic acids, C10 carboxylic acids, and C11+ carboxylic acids.

In some examples, a carboxylate stream may be prepared by a distillation, for example, but not limited to an azeotropic distillation. In some examples, an azeotropic distillation may be performed with water. In certain examples, a carboxylate stream may comprise non-acidic components. In certain examples, non-acidic components may comprise about 0.1 percent by weight (wt. %) to about 5 percent by weight (wt. %) of the carboxylate stream and/or non-acidic components may comprise about 0.5 percent by weight (wt. %) to about 3 percent by weight (wt. %) of the carboxylate stream. In other examples, non-acidic components of the carboxylate stream may include, but are not limited to, aldehydes and/or ethers.

In certain examples a metal oxide may be prepared. In some examples, the metal oxide comprises zinc oxide. Other metals that may be used in various examples of the present disclosure include, but are not limited to iron

and copper, for example, an oxide of iron and/or an oxide of copper. In some examples, more than one metal may be used, such as a combination of an oxide of zinc, an oxide of iron, and/or an oxide of copper.

In another aspect, the present disclosure provides a method of preparing a high flash point mixed carboxylate stream comprising C5-C9 carboxylic acids, C10 carboxylic acids, and C11+ carboxylic acids from a mixture of said acids and low-flash isoparaffinic hydrocarbons.

Other features of the disclosure are discussed throughout the specification.