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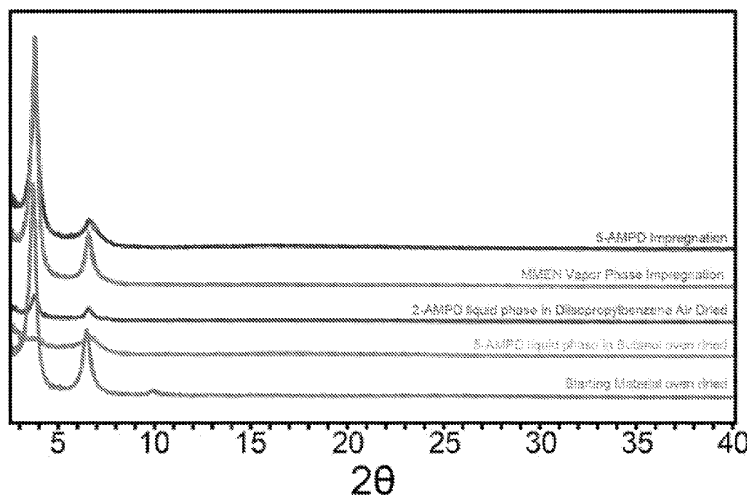


FIG. 2

(57) Abstract: Provided herein are methods of novel methods of synthesizing a metal-organic framework system by vapor-phase appending of a plurality of ligands appended to a metal-organic framework. Also, provided are methods of recycling metal-organic framework systems by detaching the ligand and re-appending the same ligand or appending a different ligand to the metal-organic framework to provide a recycled or repurposed metal-organic framework system.

[Continued on next page]

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