The development of metal-organic frameworks for oxygen separation that is both reversible and selective at room temperature

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Oxygen is a critical gas species for both medical and industry settings [1]. Currently, the mainstay for oxygen separation from air is cryogenic distillation. Unfortunately, this process is inefficient and energy intensive. Over the past decade, there have been significant efforts to generate materials that can separate oxygen from air at ambient temperatures. Metal-organic frameworks, which are hybrid inorganic-organic porous structures, have attracted significant attention in this area [2-4]. We report rationally designed metal-organic frameworks which can separate oxygen from air at room temperature across multiple sorption cycles.

Figure 1. Illustration of a metal-organic framework which displays selectivity for capturing oxygen.