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Mechanism for interaction between gases and Phthalocyanine films AMOS SHARONI, CORNELIU COLESNIUC, Department of Physics, UCSD, JEONGWON PARK, Materials Science and Engineering, UCSD, FOREST I. BOHRER, ANDREW C. KUMMEL, WILLIAM C. TROGLER, Department of Chemistry and Biochemistry, UCSD, IVAN K. SCHULLER, Department of Physics, UCSD — Phthalocyanines (Pcs) have been identified as promising candidates for electro-chemical gas sensors. They show potential for chemical selectivity via manipulation of the metal center and substitution of functional groups on the organic ring. However, for a given analyte and Pc, it is not clear which properties define the strength of response. To address this issue, we measured time-dependent current responses, of cobalt and metal free Pc, at constant voltage during exposure to various analyte vapor doses. The current in the device reduces with dosing; the response is linear with concentration and is found to follow first order kinetics. We show that the response is dominated by analyte interactions with the central Pc cavity; coordination strength governs CoPc responses, and hydrogen bonding ability governs H_2Pc responses. A model for the phthalocyanine electrical response and binding with analytes will be discussed.

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