

Along the cause-and-effect chain: On the propagation of ideas and visions within the scientific analyzer market

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As supplier and producing company in the adsorption field, we study diffusion phenomena both related to adsorption and in business field development. In the context of pure gas adsorption for texture characterization of porous materials we find phenomena which are easy to explain, e.g., the blockage of narrow micropores in Zeolith 4A dependent on the measuring temperature (see Fig. 1). Fig. 2 shows temperature profiles and breakthrough curves of mixed gas and vapor adsorption studies, measured with the 3P mixSorb dynamic sorption analyzer [3].

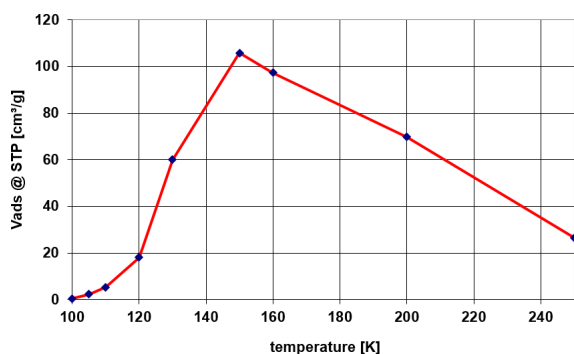


Figure 1: Nitrogen adsorption of Zeolith 4A at 101 kPa (each point taken after 48 hours), the volumes adsorbed depend on adsorptive, pressure, temperature and pore structure [1].

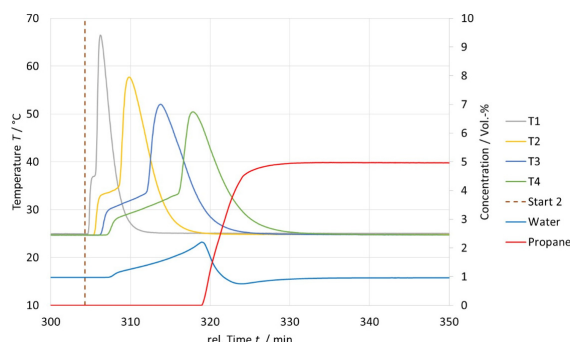


Figure 2: Competing sorption between nitrogen, water and propane in active carbon (temperature and concentration profiles), sorption of propane occurred while displacing previously adsorbed water [2].

The fact that such blocking effects in narrow micropores (Fig. 1) are still not widely known illustrates different diffusion rates of scientific information into the relevant groups of instrument users. The mixed adsorptive processes are additionally influenced by competitive effects between the adsorptive species, and that is well-known effects in the economical game. In contrast to adsorption phenomena which can be described by a Gaussian-like statistics, we find a more complex behavior of parties in economy. According to [4], the question came up how “negative Black Swans” can be prevented in our economical field of activity. We have found indications that the so-called antifragility of our organization in fact has been improved by timely movements from the forth into the third quadrant of statistical thinking (see Table 1) [5]. On this way, it can happen that the complexity of an organization increases with the antifragility, but the long-term uncertainty is reduced by specific diffusion and counter-diffusion effects.

Table 1: “The fourth quadrant”, where statistics and models fail us [4]

I. Extremely robust to Black Swans (“thin tailed distributions”)	III. Quite robust against Black Swans (“thin tailed distributions”)
II. Quite robust to Black Swans (heavy tails), simple decisions or well known problems	IV. Limits of statistics, extreme fragility against Black Swans (“fat tails”), called “Estremistan”

References

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