# New Low-Dimensional Organic–Inorganic Lead Halide Hybrid Systems Directed by Imidazo[1,5-*a*]pyridinium-Based Cation or Imines: Synthesis, Structures, Non-Covalent Interactions and Optical Properties

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## Supplementary Information

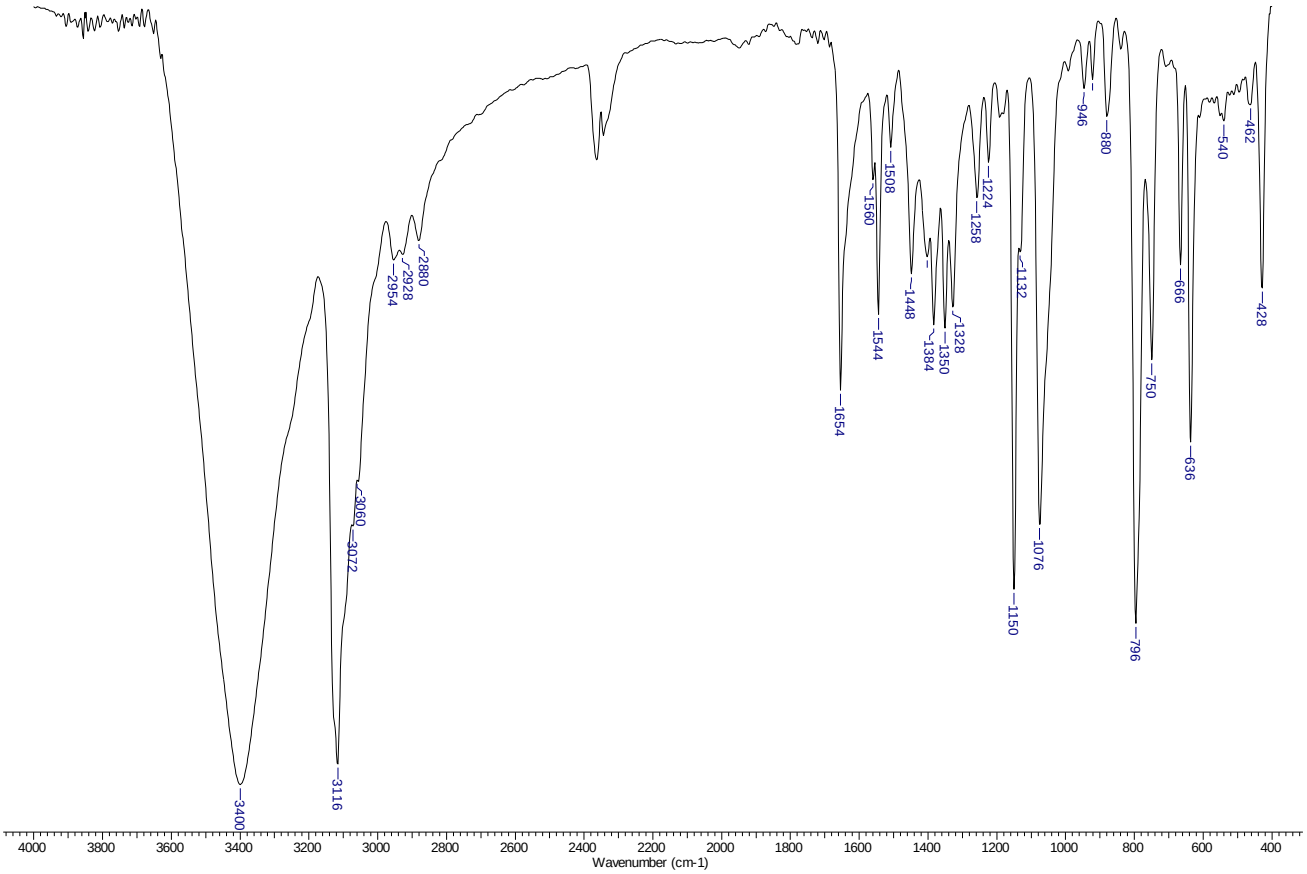


Figure S1. IR spectrum of $[L1]_{2n}[Pb_2Cl_6]_{n\infty}\cdot nH_2O$ (**1**).

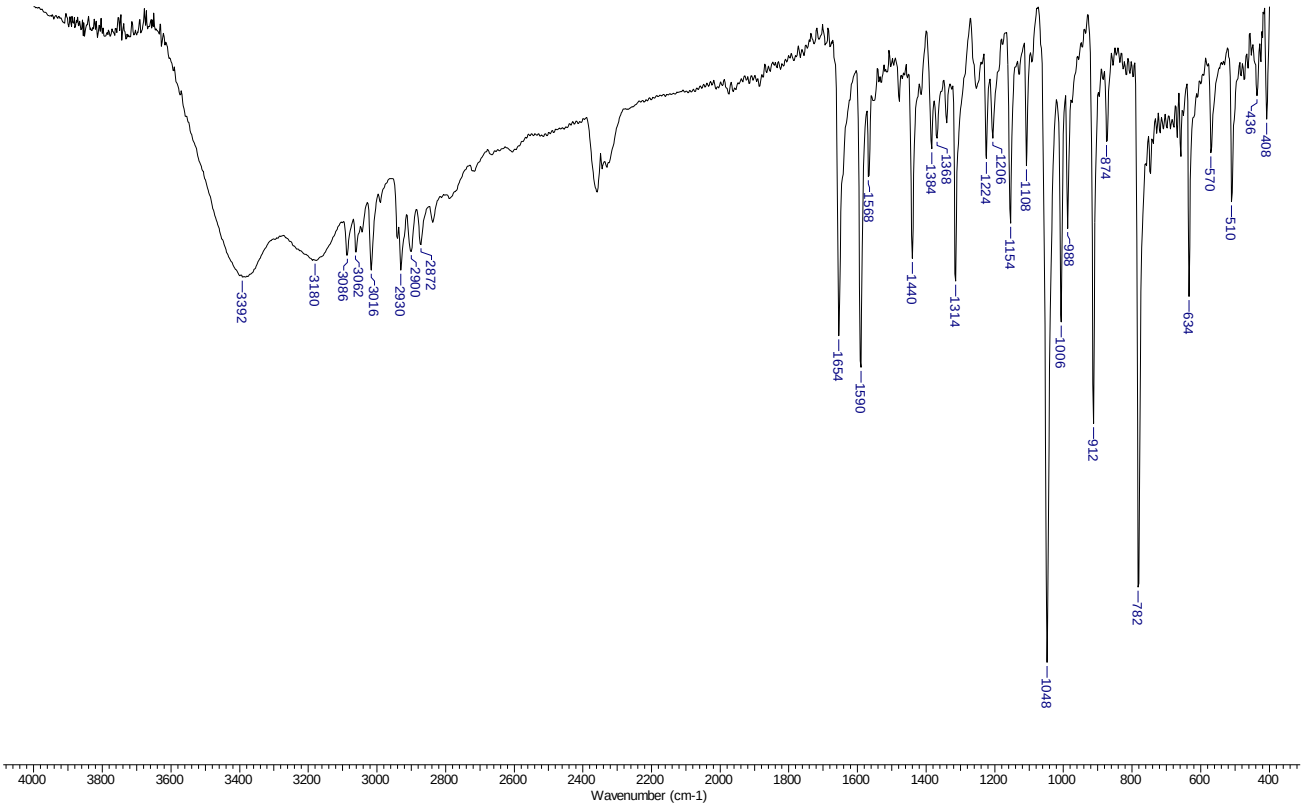


Figure S2. IR spectrum of $[PbBr_2(L2)]_{n\infty}\cdot 0.5nH_2O$ (**2**).

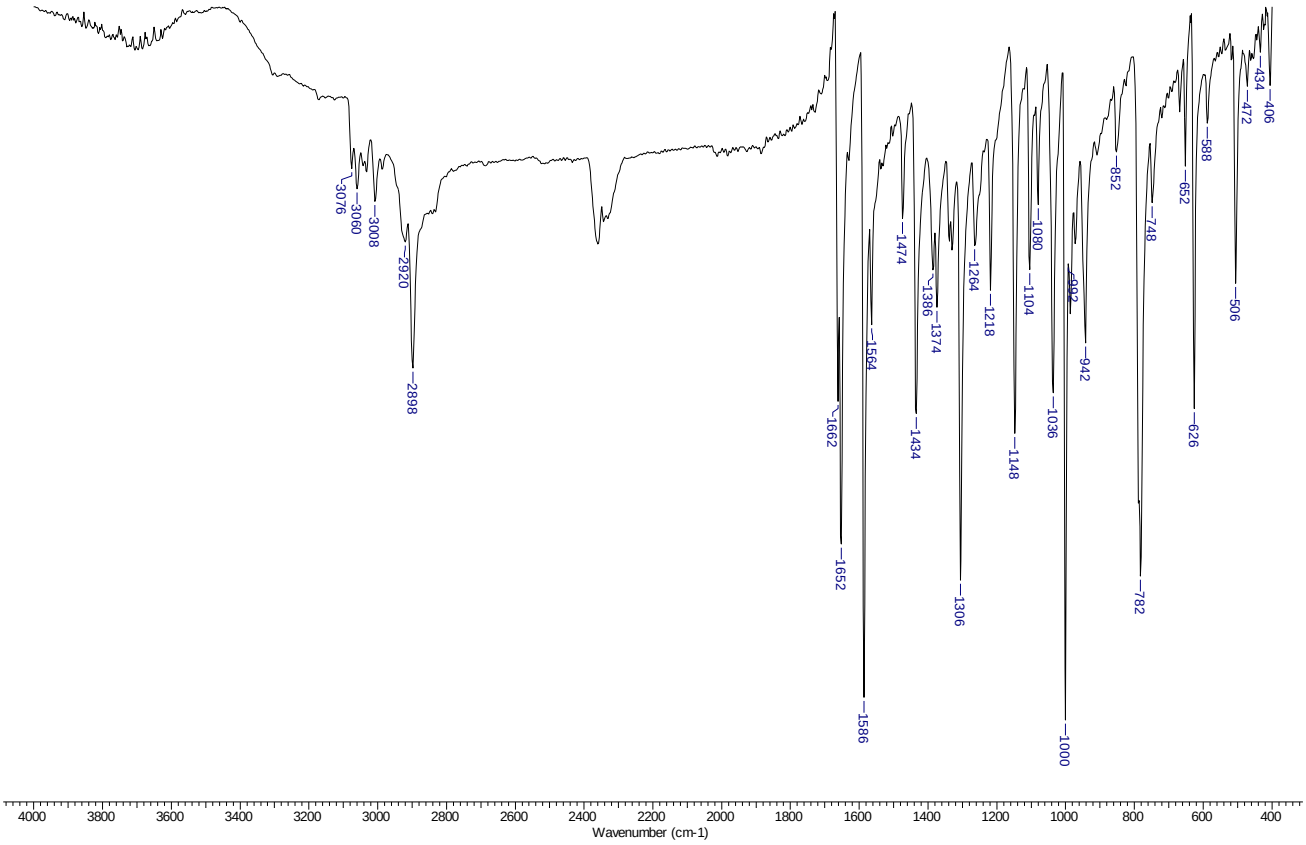


Figure S3. IR spectrum of $[PbBr_2(L3)]_2$ (**3**).

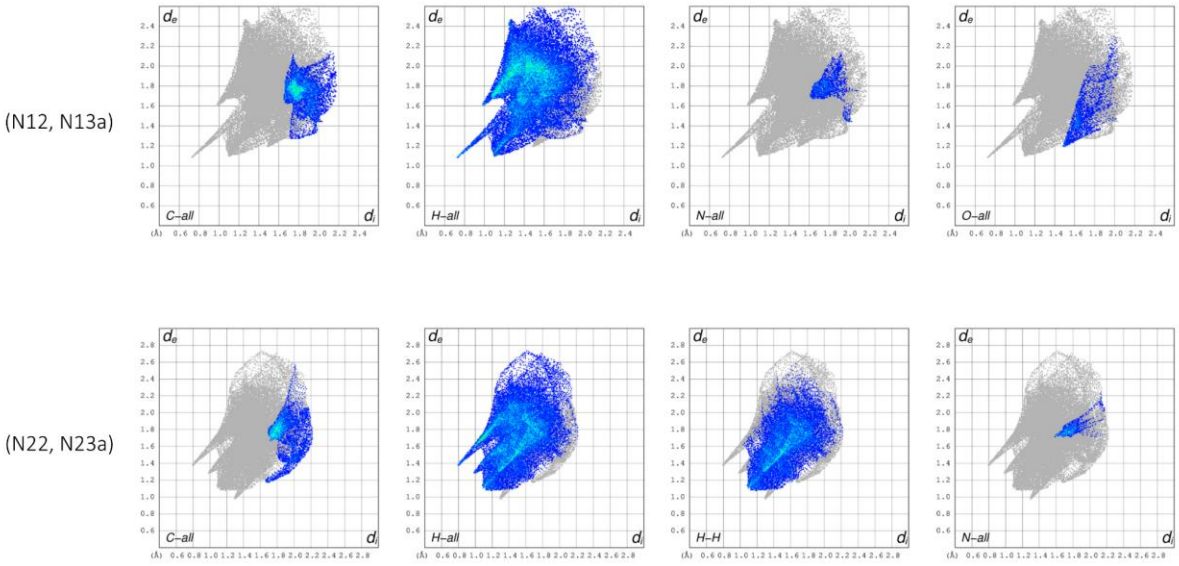


Figure S4. Selected fingerprint plots of the (N12, N13a) and (N22, N23a, major component) $[L1]^+$ cations in the crystal structure of **1** showing $X_i \cdots X_e$ interactions (where X = Cl, O, C or H).

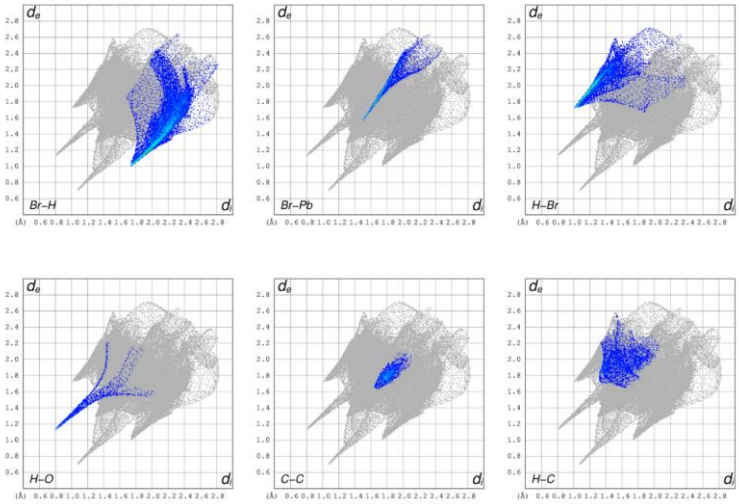


Figure S5. Selected fingerprint plots of the fragment $[PbBr_2(L2)]$ in the crystal structure of **2** showing $X_i \cdots X_e$ interactions (where X = Br, O, C or H).

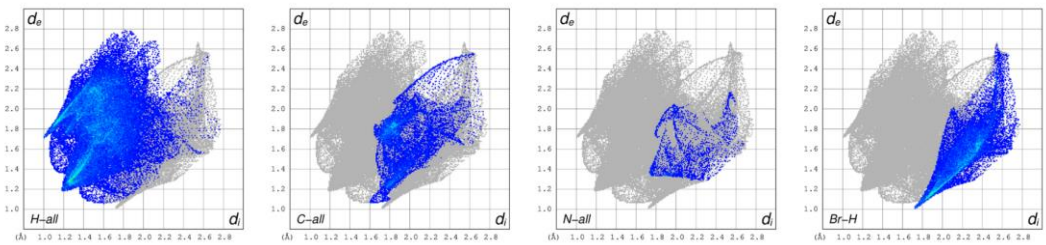


Figure S6. Selected fingerprint plots of the dinuclear molecule of **3** showing $X_i \cdots X_e$ interactions (where X = Br, N, C or H).

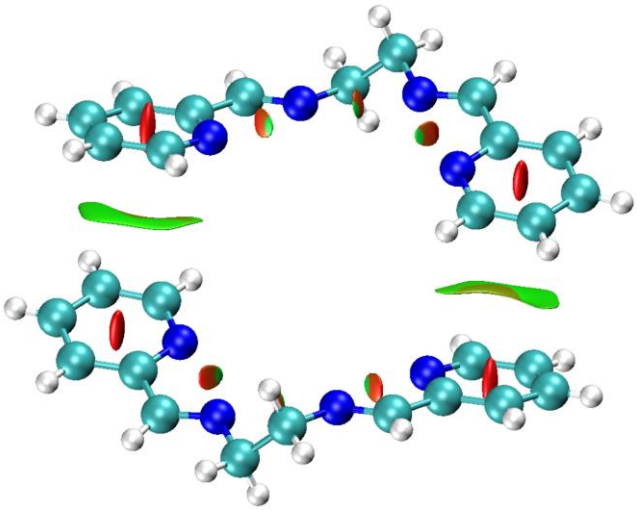

Figure S7. Reduced density gradient surfaces (isovalue of 0.5) showing weak vdW interactions (green area) between aromatic fragments of the ligands L3 in the molecular structure of **3** (lead and bromine atoms were excluded from calculations).