Annotated Example for EE

Varying degrees of specificity within the same figure. Together, the elements provide a generalized interpretation of results, as well as the specific metrics supporting the presented outcome.



Fig. 3 Typical solar PV device structures, divided into wafer-based and thin-film technologies. Primary absorber layers are labeled in white, and thicknesses are shown to scale. c-Si encompasses sc-Si and mc-Si technologies. GaAs cells use thin absorbing films but require wafers as templates for crystal growth. For III-V multijunctions, sub-cells are shown for the industry-standard GaInP/Ga(In)As/Ge triple-junction cell, and some interface layers are omitted for simplicity. A representative single-junction a-Si:H PV structure is shown here, although PV performance parameters used elsewhere correspond to an a-Si:H/nc-Si:H/nc-Si:H triple-junction cell. Front contact grids are omitted for thin-film technologies since the metals used for those grids do not directly contact the active layers and are thus more fungible than those used for wafer-based technologies.



Fig. 5 Alternative PV technology classification scheme based on material complexity. Crystal unit cells or molecular structures of representative materials are shown for each technology, with crystal bases highlighted and expanded (right column) to illustrate the relative complexity of different material systems. Wafer-based materials consist of single- or few-atom building blocks. Thin-film materials range from amorphous elemental materials (a-Si:H) to complex nanomaterials with building blocks containing up to thousands of atoms (e.g., PbS QDs). Lattice constants and bond lengths are shown to scale, while atomic radii are 40% of actual values in comparison. Single carbon atoms (brown) in the perovskite crystal structure represent methylammonium (CH₃NH₃) cations.



rig. 3 Alternative PV technology classification scheme based on material complexity. Crystal unit cells of moleculapstructures of representative materials are shown for each technology, with crystal bases highlighted and expanded (right column) to illustrate the relative complexity of different material systems. Wafer-based materials consist of single- or few-atom building blocks. Thin-film materials range from amorphous elemental materials (a-Si:H) to complex nanomaterials with building blocks containing up to thousands of atoms (e.g., PbS QDs). Lattice constants and bond lengths are shown to scale, while atomic radii are 40% of actual values in comparison. Single carbon atoms (brown) in the perovskite crystal structure represent methylammonium (CH₃NH₃) cations.