Science & Technology

Chemists Discover Key to Improving Solar Power

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In the race to make solar power more economical, one of the most exciting recent discoveries is that solar cells can be manufactured at a lower cost using crystals called perovskites instead of silicon. These solar cells have not been made commercially available, however, in part because perovskite crystals contain lead, which scientists fear could leach into the environment.

Now a group of Columbia chemists say they have found a way around this impasse. By carefully examining how perovskites convert sunlight into electricity, the researchers have concluded that conductive crystals could be made from any number of materials. They say the discovery opens up many new possibilities for designing super-efficient solar cells.

“What we’ve done is describe the fundamental structural properties that make perovskites such great semiconductors,” says chemistry professor Xiaoyang Zhu, who reported his team’s results in the journal *Science*. “And our findings suggest that similar semiconductors could be made from nontoxic metals or synthetic substances.”

In the past few years, many scientists have experimented with making perovskites out of tin, which resembles lead in its chemical properties, only to find that the resulting crystals underperform as solar-cell components. Zhu says that his research ought to reenergize these efforts, since it suggests that perovskites made of tin or altogether different elements, if produced correctly, could act as efficient semiconductors.

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