

280e Why Scale-up Still Matters

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The art and science of scale-up of molecular scale discoveries from the bench scale to commercial production scale has been at the core of the chemical engineering profession. It was practiced by utilizing interdisciplinary teams of scientists and engineers that employed both modeling and pilot plant experimentation. Nowadays, seemingly the art of scale-up is disappearing as even major companies have disbanded their scale-up multidisciplinary teams, decommissioned or moth-balled their pilot plants and retired professionals with scale-up know-how. Admittedly, the number of new processes being introduced per year has been reduced, but this is only a temporary phenomena as novel environmentally benign processes will have to be implemented. Often one argues that newly growing research centers in Asia and elsewhere will take the role of providing scale-up facilities and know-how. Relying only on that would be equivalent to reinventing the wheel. Scale-up still matters and the knowledge base for scale-up must be maintained here in the US. This requires judicious leveraging of resources from the federal and the private sector, to establish national centers of excellence and fully utilize the available pilot plants staffed by experienced people at some companies which can be made available to others. Several examples of the importance of scale-up in a number of technologies utilizing multiphase reactors will be shown.