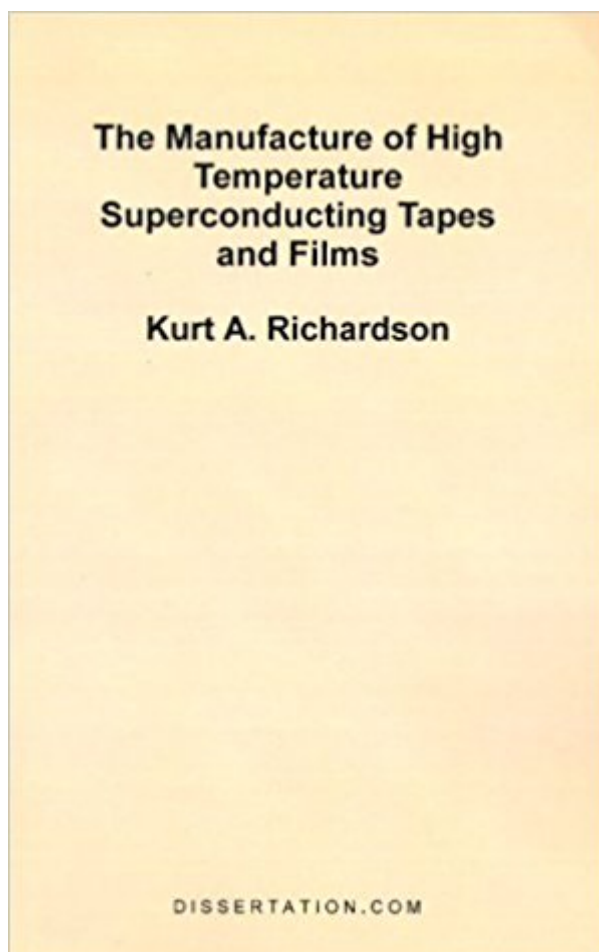


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The Manufacture Of High Temperature Superconducting Tapes And Films



Synopsis

Book by Richardson, Kurt A.

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The phenomena of superconductivity has enormous industrial potential, but the penetration of superconductor-based products has, thus far, been slow. An indisputable fact is that there are prizes, and profits, for the teams that solve the critical problems in understanding and processing these complex materials. The continuous processing of superconducting tapes and wires is a necessary stage that will open up the industrial market to the designers of a diverse range of time and energy saving devices, particularly in ultra-fast computing and lossless power transmission. The aim of the research reported herein was to investigate the fabrication of superconducting tapes and films via two different processes, namely: the established PIT technique, and a less well known electrochemical route. The PIT research yielded partially textured (a characteristic not found in previously reported thallium-based PIT tapes) and high purity tapes with promising transport properties. The main subject of this work is the electrodeposition of superconducting films with particular emphasis on the optimisation of the deposition process, as opposed to the optimisation of the post-deposition heat treatment. This is not a well researched area. Therefore the research herein deals with the mechanisms of the deposition process in order to achieve a high standard of reproducibility in producing a variety of superconductor precursor films. The heat-treatment of the as-deposited films was determined, and results are presented concerning the characteristics of the

resulting superconducting films. An attempt was made to fabricate, for the first time via electrodeposition, (Tl,Pb)-1223 films. Superconductivity was successfully observed in both Bismuth- and Thallium-based films. Extensive further work is required, but the impact upon society from superconducting devices draws ever nearer.

Surprisingly I found a most interesting and captivating piece of work hidden beneath a rather bland exterior, the author most surely knows his skunk.

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I was baffled; swirling, witty writing style, thorough research methods, persuasive conclusions - this guy is a genius.

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