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Sommario/riassunto

The choice of the coolant is one of the main technical issues concerning fast reactors design, since it determines design approach as well as safety, technical and economic characteristics of the system. This publication provides a comprehensive summary of the status of the liquid metal coolant technology development for fast reactors, with regard to basic data and main technological challenges. It starts with historical remarks on the nuclear power development, provides a complete survey of physical and chemical properties of liquid metals and discusses the coolant quality control and thermal-hydraulics studies for both sodium and lead alloys systems. Other chapters elaborate on radioactivity of coolants and describe past experiences as well as current projects. Finally, design objectives, main research and technology development challenges of innovative fast reactor concepts, currently under investigation in Russia, having sodium, lead-bismuth eutectic, and lead as coolant, as well as the status of the respective research and development activities are summarized.