particles, there is a physical contact of the granules with each other. If the interaction between the granules is stronger than that between the granules and the substrate, the crystallites are aggregated into big clusters (liquid-like coalescence). This process would be enhanced with the increase in temperature.

The consideration of the experimentally observed features of the effect of microstructure on superconducting properties of the films relies on a phenomenological representation of these films as a set of superconducting granules. The reasons explaining the effect of the microstructure character on T_c and ΔT_c stem from the sensitivity of superconducting properties to different types of defects and the importance of the role of weakly bound grain interlayers (Joseffson's contacts) on the critical current value. It is likely that superconducting state is formed inside the grains at the temperatures below T_c. In the case of a non-uniform granular structure, the grains are coupled by a weak Joseffson force. As soon as a smooth uniform structure is formed, the Josefsson contacts couple the superconducting grains into a single current-conducting system, in which superconducting state is maintained on a large area of the film at $T_c \geq$ [illegible]9 K. To sum up, it should be noted that minimization of the weak forces, combination of individual superconducting grains, and decrease in the grain misorientation angle in the *ab* plane to a zero value, which ensures maximum values of T_c and J_c have been achieved by specially selecting the conditions od deposition.

REFERENCES

1. E. J. Cukauskas and L.H. Allen, Physica. C, **313**, Nos. 1–2, 11–20 (1999).
2. V. A. Ivanov, Zh. Neorg. Khim., **35**, No. 4, 1024–1067 (1990).
3. E. K. Golman and D. A. Plotkin, Fiz. Tverd. Tela, **42**, No. 3, 397–400 (2000).
4. A. A. Abrikosov, Usp. Fiz. Nauk, **168**, No. 6, 683–695 (1998).
5. J. D. Riches and J.A. Alarco, Physica. C, **312**, Nos. 1–2, 21–27 ([illegible]).
6. F. N. Bukhan'ko and N. A. Doroshenko, Fiz. Tverd. Tela, **33**, No. 6, 1754–1761 (1991).
7. J. D. Jorgensen, Phys. Rev. B, 36, No. 7, 3608–3616 (1987).
8. E. Khuanbai, N. Kh. Irbaev, and D. B. Kargin, Rus. Phys. J., [illegible]8, No. 6, 663–664 (2005).
9. E. Khuanbai, N. Kh. Irbaev, and D. B. Kargin, Bulletin of the Al Farabi Kaz. NU, Fiz. Ser., No. 2, 99–106 (2004).