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(57) Abstract :

A 5 novel gabapentin-loaded cubogel has been developed for transdermal management of neuropathic pain. This nanostructured formulation incorporates gabapentin into cubosomes—lipid nanoparticles composed of glycerol monooleate and stabilized by Poloxamer 407—embedded in a skin-friendly gel. Prepared via a cold mechanical process, the cubogel offers localized, sustained drug delivery, 10 overcoming the limitations of oral gabapentin. It features nanometer-sized particles (~50–300 nm), high entrapment efficiency (~85%), good colloidal stability (zeta potential ~-30 mV), and suitable viscosity (~4000 cP) for topical use. In vitro studies show prolonged drug release over 8 hours, and skin irritation tests confirm safety. This innovative approach enhances pain relief, reduces systemic side effects, 15 and improves patient compliance.

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