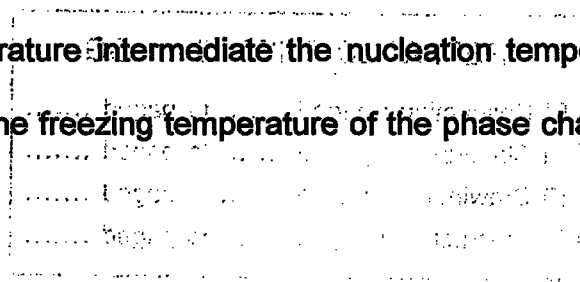


ABSTRACT

FREEZE PROTECTIVE SHIPPING UNITS

Disclosed are shipping and/or storage units (10) for containers (11) of liquid compositions, such as solutions of biologically active proteins, which are susceptible to physicochemical change upon freezing. Preferred container holders have double sidewalls (12, 13) and a freeze indicator (16) adjacent a container-accommodating cavity (14). A phase change material (22) such as a carboxymethylcellulose gel is disposed in the enclosed space between sidewalls (18) and freezes at a temperature higher than the nucleation temperature of the composition. A freeze indicator (16) provides an irreversible visual signal upon reaching a temperature intermediate the nucleation temperature of the liquid composition and the freezing temperature of the phase change material (22).

Figure (3)



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