This article does not address thermal processing of anthocyanins or the stability of the blue color over a broad pH range. On the contrary, this article confirms that the color of anthocyanins depends on the pH of the solution.

WO 79/01128 A1 relates to a colorant from a natural source which produces various colors in food and beverages. The colorant is the anthocyanin from "Heavenly Blue" Morning Glory, peonidin 3-(dicaffeylsophoroside)-5-glucoside. Gels having a pH from 2.0 to 8.0 were prepared by adding gelatine to a buffered solution of this anthocyanin. The colours ranged from purplish red to deep blue, depending on the pH of gel. The colors were stable for at least 320 hours. This document does not disclose thermal processing of the gel.

Sensient Technologies proposed a solution, currently in the market, named Gardenia Blue, which is produced by the reaction between iridoids extracted from the fruit of *Gardenia jasminoides* and α-amino acid with the presence of proteolytic enzyme. Paik et al. (2001) reported that the stability of the Gardenia Blue under different conditions depended on the type of amino acid used in the production of the colorant. Ecoflora and Wild companies also have developed blue colorants based on genipin-protein or genipin-aminoacids reactions. Ecoflora has submitted an application for approval of its product to the U.S. Food and Drug Administration (FDA). These colorants are not yet approved in the European Union nor in the U.S.A. for food applications. Shaoyuan Xiong et al. (2006), (J. AGRIC. FOOD CHEM., 54, 6201-6208) discuss the effect of ferric and ferrous ions, pH and temperature on the stability and antioxidant activity of black currant anthocyanins (BCA), as well as the recovery of BCA from a thermoreversible glucan gel.

Therefore there is a need for a natural blue colour which can be used in food products, in particular in dairy matrices, with a large pH range and which is stable under thermal processing and during storage under various conditions, including at ambient conditions, chilled conditions and frozen conditions. It is also important to ensure a sufficient supply of the natural blue encapsulate.

SUMMARY OF THE INVENTION

It is an object of embodiments of the invention to fulfil the need for a food-grade natural blue colour. This object is solved by means of invention defined in the independent claims. The dependent claims further develop the central idea of the invention.

In a first aspect, the invention relates to a food-grade encapsulate comprising gelled proteins, a colorant component and metal ions, wherein said colorant component comprises anthocyanins, anthocyanidins, or mixtures thereof, wherein said encapsulate has a stable blue colour.