

ABSTRAK

Limbah garam merupakan hasil dari penguapan atau endapan air laut dalam pembuatan garam. . Limbah garam dapat dimanfaatkan untuk diolah menjadi produk turunan garam. Penelitian ini bertujuan untuk mengetahui Produksi Garam Epsom Dengan Metode Bertingkat, serta menganalisis kualitas dan kuantitas garam Epsom yang dihasilkan. Produksi dilakukan di media *prototype* lalu di kristalisasi ditempat *tunnel* di Kedai Reka Cipta Garam, Kabupaten Pamekasan, Madura, menggunakan metode evaporasi alami di bawah sinar matahari. *Bittern* yang digunakan memiliki kadar kepekatan 33–35 °Be. Penelitian ini juga mengamati pengaruh parameter lingkungan seperti intensitas cahaya, suhu air, pH, suhu dan kelembaban ruang terhadap proses kristalisasi. Metode yang digunakan adalah eksperimen kuantitatif dengan pengukuran laboratorium dan lapangan. Analisa kualitas dilakukan secara fisik (warna, tekstur, bentuk, dan ukuran) serta kimia (kadar Air, SO_4^{2-} dan Mg). Hasil menunjukkan bahwa seluruh sampel garam Epsom memiliki warna putih, bentuk pipih hingga kubus, ukuran 500 μm – 2 mm, dan tekstur kasar. kadar air tidak da perubahan nyata yang signifikan, Kadar magnesium dan sulfat meningkat seiring dengan naiknya derajat Be. Hasil kualitas Analisis kadar air nilai tertinggi 34 1,06% sedangkan nilai terendah pada pada sampel 33 1,05%. kadar sulfat tertinggi yaitu pada sampel 33 senilai 711,890 mg/l, sedangkan nilai sulfat terendah berada pada sampel 34 senilai 601,577 mg/l. Analisis magnesium dalm grafik nilai tertinggi pada sampel 33 senilai 13,320 g/l sedangkan nilai terendah berada pada sampel 35 dengan senilai 9,667 g/l. Hasil kuantitas garam yang paling banyak di dapatkan adalah pada sampel *prototype* 33A dengan hasil 1216,4 gram sedangkan hasil panen paling sedikit berada di media sampel *prototype* 35 A dengan nilai 1016,5 gram. Parameter lingkungan seperti suhu dan intensitas cahaya berpengaruh signifikan terhadap laju kristalisasi. Penelitian ini menunjukkan bahwa *bittern* dapat dimanfaatkan sebagai bahan baku alternatif dalam produksi garam Epsom bernilai ekonomis tinggi dan ramah lingkungan. Temuan ini diharapkan dapat menjadi solusi pengelolaan limbah garam serta membuka peluang usaha baru bagi masyarakat pesisir.

Kata Kunci: Garam Epsom, *Bittern*, Kristalisasi, Parameter Lingkungan.

ABSTRAK

Salt waste is a byproduct of evaporation or sedimentation of seawater in salt production. Salt waste can be utilized to be processed into salt derivative products. This study aims to determine the production of Epsom salt using a multi-stage method, as well as to analyze the quality and quantity of Epsom salt produced. Production was carried out in a prototype medium and then crystallized in a tunnel at the Kedai Reka Cipta Garam facility in Pamekasan District, Madura, using natural evaporation under sunlight. The brine used had a concentration of 33–35 °Be. This study also observed the influence of environmental parameters such as light intensity, water temperature, pH, room temperature, and humidity on the crystallization process. The method used was a quantitative experiment with laboratory and field measurements. Quality analysis was conducted physically (color, texture, shape, and size) and chemically (water content, SO_4^{2-} , and Mg). The results showed that all Epsom salt samples had a white color, flat to cubic shape, size ranging from 500 μm to 2 mm, and a coarse texture. There was no significant change in water content, while magnesium and sulfate levels increased with rising Be degrees. The highest water content value was 34.106%, while the lowest was 33.105%. The highest sulfate content was 711.890 mg/l in sample 33, while the lowest was 601.577 mg/l in sample 34. Magnesium analysis in the graph shows the highest value in sample 33 at 13.320 g/l, while the lowest value is in sample 35 at 9.667 g/l. The highest quantity of salt obtained was in prototype sample 33A, with a result of 1,216.4 grams, while the lowest harvest was in prototype sample 35A, with a value of 1,016.5 grams. Environmental parameters such as temperature and light intensity significantly influence the crystallization rate. This study demonstrates that bittern can be utilized as an alternative raw material in the production of economically valuable and environmentally friendly Epsom salt. These findings are expected to provide a solution for salt waste management and open new business opportunities for coastal communities.

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Kata Kunci: Epsom Salt, *Bittern*, Crystallization, Environmental Parameters.