

Formulation Study

Pomegranate Extract – Direct Compression

Aim of study

The aim of the present formulation study was to find an alternative for the commonly used soft-gel-encapsulation of Pomegranate extract.

Instead, a simple, two-component formulation suitable for direct compression was developed.

Pomegranate extract

Pomegranates have been known for hundreds of years for their multiple health benefits, including antimicrobial activity.

Research indicates that pomegranates and their extracts may serve as natural alternatives due to their potency against a wide range of bacterial and viral pathogens. Nearly every part of the Pomegranate plant has been tested for antimicrobial activities, including the fruit juice, peel, arils, flowers, and bark.¹

Pomegranate extract is typically administered as 250 mg dose soft-gel capsule.

Direct compression tableting is not only cheaper in production but also simplifies the formulation requirements. The goal of this experiment, therefore, was to make directly compressible 250 mg Pomegranate extract tablets.

Excipient(s) used

The high-functional excipient PROSOLV® NX 90 is an all-in-one composite containing microcrystalline cellulose as a filler-binder, colloidal silicon dioxide as a glidant, a disintegrant, and a lubricant. In order to fulfill the regulatory requirements of various countries, different PROSOLV® NX 90 grades with different disintegrants and lubricants are available.

All of these grades all have equivalent powder and tableting properties. Detailed information about the different grades are described in the JRS brochure about PROSOLV® NX 90. The special co-processing during the PROSOLV® NX 90 production ensures the homogeneous distribution of the single ingredients within the particles and leads to synergistic effects in terms of functional properties.

PROSOLV® NX 90 is characterized by an excellent compactibility resulting in a mechanical robustness of the tablets combined with a fast disintegration. Furthermore, PROSOLV® NX 90 ensures lubrication during tablet manufacturing and provides a high robustness to over-mixing as the lubricant is fixed in the co-processed composite structure. As ready-to-use excipient, PROSOLV® NX 90 makes the tableting process additionally convenient and cost-efficient as only one blending step with the active is required before the mixture can be compacted into tablets.



Formulation	1	2
PROSOLV® NX 90	60 %	50 %
Pomegranate extract*	40 %	50 %
Pomegranate extract per tablet	250 mg	250 mg
Total tablet weight	625 mg	500 mg

* Pomma® extract (Stauber PEXL powder, lot #B319002A)

Procedure

PROSOLV® NX 90 and Pomegranate extract were mixed for 15 minutes in a Glen Mills Turbula Mixer. Round, flat-faced tablets were then compressed using a Riva Piccola Rotary Instrumented Tablet Press at five different compaction forces.

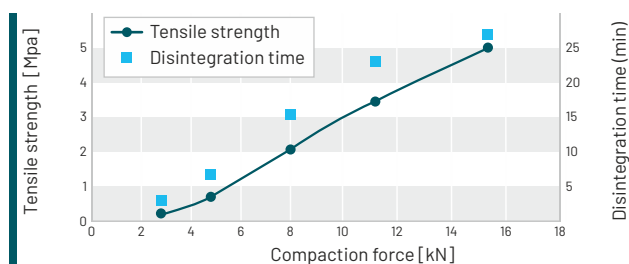


Fig. 1 Formulation 1 (40 % API load)

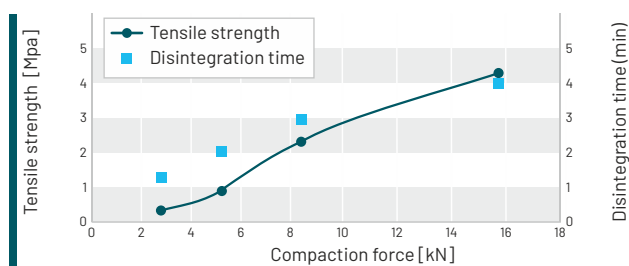


Fig. 2 Formulation 2 (50 % API load)

Conclusion

The PROSOLV® NX 90 made it possible to simply directly compress Pomegranate extract into tablets with good physical integrity. Two formulations were made with 50 % and 60 % PROSOLV® NX 90 respectively. In general, pomegranate formulation 1 with more PROSOLV® NX 90 (60 %) made tablets with higher tensile strength compared to the tablets that only had 50 % PROSOLV® NX 90 (formulation 2). While both formulations make very hard tablets with acceptable disintegration times, additional superdisintegrant may be added if shorter disintegration times are desired.



Pic. 1 Pomegranate extract powder (left) and finished Pomegranate tablets (right)

Reference

- 1 <https://www.hindawi.com/journals/ecam/2013/606212/>

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