

THE DETERMINATION EXPERIMENTAL OF VISCOSITY STRUCTURAL FOR NON – NEWTONIAN MIXTURES

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Abstract: The experiments was realized for an mixture with average consistence, S-L type, with solid phase participation (meat) in 50% proportion and liquid phase participation (water) in 50 % proportion for an constant revolution ($n=90$ rot/min) and fill degree of mixing tank by 25 % proportion.

The experimental determination was realized by an stall which allow the obtaining of non-newtonian mixtures in laboratory conditions.

Keywords: non–Newtonian blends, experimental stand, variable viscosity,

1. DESCRIPTION THE EXPERIMENTAL STAND

For the studies and the researches concerning the optimization processes of food products with variable viscosity (watery blends of flour), in the frame doctoral thesis, achieved a blender with device of rotary mixing (figure no. 1), with help is willed studied the power consumption for the realization homogeneous blend, because operation of mixing is efficient when is achieved a good effect of with a reduced consumption of energy.

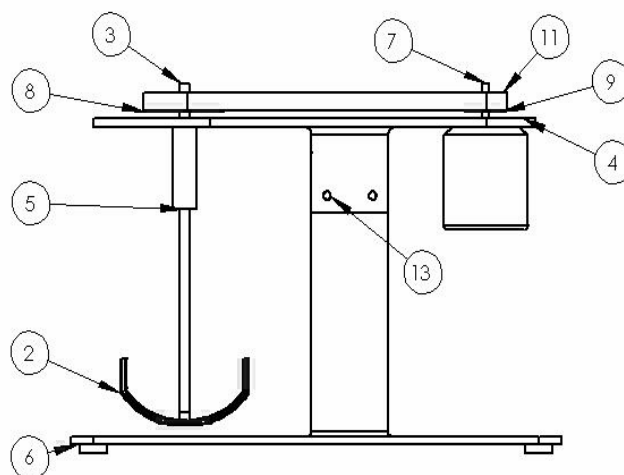


Fig. no 1 The ensemble stand

1 - the vessel blender, 2 - anchors, 3 - arbor blender, 4 - support for transmission through belts, 5 - camp with bears, 6 - support metallic of support, 7 - electromotor, 8 - the denticulate wheel derived, 9 - the denticulate wheel conductress, 10 - element of support the vessels of mixing, 11 - denticulate belts, 12 - guard box, 13 - with device of revolving.

The blender (figure no. 1) with discontinuous operation is achieved from the vessel of mixing 1, rested on a metallic frame 6 the fixed and of by of a element guy the armlet from plastic 10.

The actuation devices of mixing are achieved an asynchronous engine with converter of frequency 7, through transmission of denticulate belts 9.

The utilization transmissions through broad denticulate belts, he achieved, from the fact as the he presents a report of transmits constantly, erect efficaciousness, he don't presents the phenomenon of elastic slide, don't require erect retightening the and therefore don't load the arbor from require the periodic tuning distances among axe.

In the case which in are willed achieved the system non- Newtonian through formation of crust, for the preclusion sticking systems of the walls vessels, the vessel of mixing will be foreseed with a cloak where with circulates an agent of cooling.

The vessel of cylindrical mixing with flat bottom the si curved bottom is achieves from transparent perspex for the visualization operations of mixing. Arbor blender is of circular full section, builded dintr the nub from nirosta.

To the projection and the calculus arbors from angle of rigidity, he took count of as a matter of fact as the the arrow flexural in the law wheel denticulate his is else little than 0,01 - 0,03 from the natural module of denticulate wheel.

For the calm operation devices of mixing, he achieved a superior camp. The superior camp takes over the radial tasks the axial si(the weight arbors and blender) carry solicit the device of mixing, he has the in component two bears radially axial - with conical reel.

The camp is fixed on arbor with of a help elastic split bushed bear on generatrix, assurance against looseness is achieved with a mortar with notched brim the si with a safeseat washer with notched brim.

Arbor is fixed in the wheel driven by dint of parallel feather. For the modification height devices of mixing in the vessel of suggested mixing the of a utilization bushed bear with bear radially axial -, mount the in the denticulate wheel, and for the inclination devices of mixing is achieved with help unuor adjustable screws.

3. METHODOLOGICALLY OF RESEARCH

For the study operations of they blend the systems non -Newtonian with variable viscosity is willed studied with rev devices of mixing, because he offers the information about consistences submissive phases mixing, what rev can be varied with of a help converter of frequency, couple of torsion ceste causes with a transcriber of couple.

As sizes of reference chosen the property rheological ale submissive phases mixing, quantitative expression phases and rev devices of mixing.

For the realization condition of thing are willed established follower stage:

1. Settlement variable sizes concerning to phase mixing:

- nature phases;
- density, consistence, granulometry, viscosity

2. Settlement what sizes characterised the ultimate blend:

- density;
- viscosity
- superficial tension

3. Settlement variable sizes in online what indexes characterise the regime of thing:

- couple of torsion,
- rev,
- the diameter vessels of mixing,
- temperature of thing,
- distance blender against the bottom vessels,
- width arms blender,
- sprocket devices of mixing in vessel

4. Settlement indexes of quality

- the degree of homogenization
- power necessary mixing

4. CONCLUSIONS

The experiments was realized for an mixture with average consistence, S-L type, with solid phase participation (meat) in 50% proportion and liquid phase participation (water) in 50 % proportion for an constant revolution ($n=90$ rot/min) and fill degree of mixing tank by 25 % proportion).

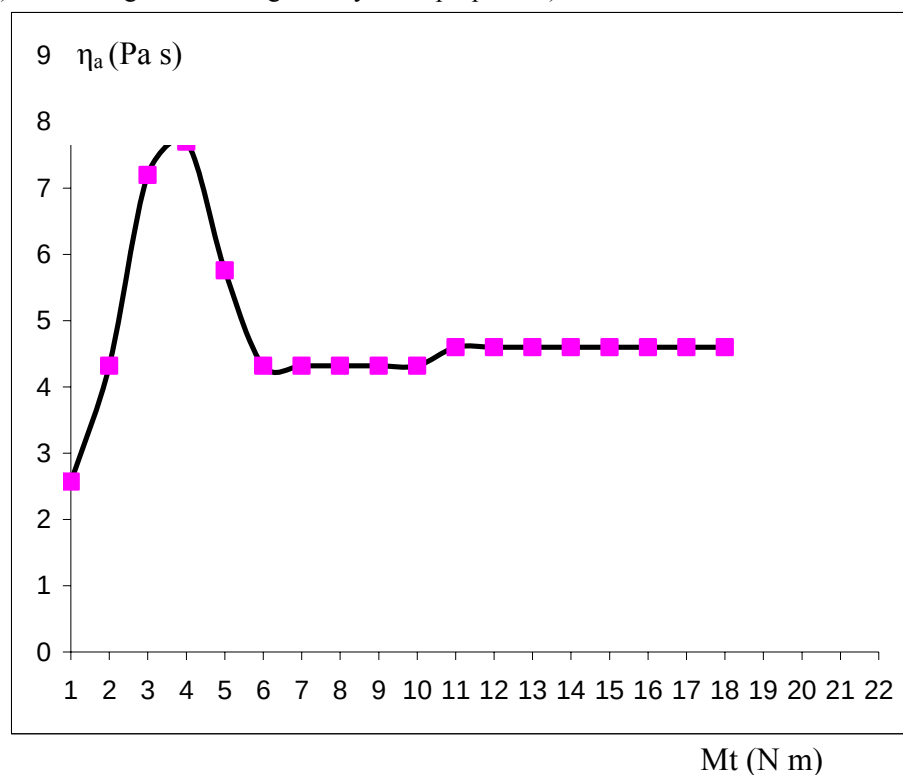


Fig. no 2. The variation a viscosity for an mixture with average consistence in function of couple torsion

This paper content the study of correlation between the torsion moment produced by mixing device which is in rotary motion with the value of structural viscosity created into the non-Newtonian mixture, propriety (the structural viscosity) which characterized the degree of homogenization and power consumption needed to result the mixture.

The experimental determination for revolution moment produced by the shafts mixer, it realized by measuring with electrosensitives traductors rosette type 1-XK 11 E – 3/350.

The mode of a viscosity variation in couple torsion function for an mixture with average consistence, S-L type, with solid phase participation (meat) in 50% proportion and liquid phase participation (water) in 50 % proportion for an constant revolution ($n=90$ rot/min) and fill degree of mixing tank by 25 % proportion it is presentation in figure no. 2.

5. REFERENCES

[1] Savin C., - Rezultate experimentale la optimizarea procesului de amestecare a produselor agroalimentare, Teza de doctorat, 2005