

Technological innovation and sustainability in the colored economies

Rodríguez Reyes, Mariha¹, Mendoza Juárez Juan¹, David Kauffman, Paul A.² and Nelson, Rebeca¹

¹Maestría de gestion, Universidad Autónoma del Xxx, Chile.

² Departamento de Administración, Universidad Autónoma del Xxx, México.

Abstract. XXXXXXXX XXXXXXXX XX XXXXXXXXXXXX XX X XXXXXXXX
XXXXXXXXXXXXXXXXXXXX XX XXXXXXXX XXXXXXXXXXXX, XXXXXXXXXXXXXXX XX XXX
XXXXXXXXXXXX XX XXX XXXXXXXXXXX XXXXX XX XXXXX XXXXXX XXX XXXXXXXXXXX.
XXx XXXXX XX XXXXXXXX' XXXXXXXX XXXXXXXX XXX XXXXXXXXXXX XX XXXXXX.
XXXXXXXXXX XXXXXXXX XXXXXXXX XXX XXXXXXXX XXX XXXXXXXXXXX XX XXX
XXXXXXXXXXXX XXXXXXXXXXX XX XX XXXXXXXXXXX XX XXXXXXXXXXX XX XXX
XXXXXXXXXX XX XXXXXXXX. XX XXXXX XX XXXXXXXX XXXXXXXXXXX XXXXXXX XXX
XXX XXXXXXX XXXXXXXXXXX XX XXX XXXXXXXXXXX XX XXXXXXX XXXXXXX XXXXXXX
XXXXXXXX XX XXX XXXXXXX XXXXXXXXXXX XXXX XXX XXXXX XX XXXXXXX, XXXXXXX,
XX XXXXXXX, XXX XXXXXXXXXXX XXXXXXXXXXX XX XXXXXXXXXXX XX
XXXXXXXXXXXX XX XXXXXXX XXXXXXXXXXXXX XX XXX XXXXXXX XX XXXXXXXXXXX
XXXXXXX. Xx XXXXXXXX XXXXXXXXXXXXX XX XXX XXXXXXX XXXXXXXXXXX XXXXXXX
XX XXXXXXXXXXXXXXX XXXXXXX XXXX XXXXXXXXXXX XX XXX XXX XXXXXXX,
XXXXXXXXXXXX XXXXXXX, XXX XX XXX XXXXXXX XXXXX XX XXXXXXXXXXX XXXXXXX
XXXX XXXX XXX XXXXXXXXXXX XX XXXXXXX.

Keyword: XXXX, XXXX, XXXX.

1 Introduction

Xxx xxxxx xx xxx xxxxxxxx xx xxxxxxxx xxx-xxxxxxx xxxxxxxxxxxx xx xxxxxxxx
xxxxxxxxxx xx xxxxxxxx xx xxx xxxxxx xxx xxxxxxxxxxxxxx xx xxxxxxxx xxxxxxxxxxxx,
xxxxxxxx xx xxxxxx xx xx xxxxxxxxxxxx xxxxxxxxxxxxxxxx xxxxxxxx xxxxxxxx xx xxxxxxxx
xxxxxxxxx xxxxxxxxxxxx. Xxx xxxxx xxx xxxxxxxx xx xxx xxxxxxxxxxxxxx xx
xxxxxxxxxxxxxxxxxx', xxxxxxxx xxxxxxxxxxxx xxx xxxxxxxx xxxxxxxxxxxxxx xx xxx xxxxxxxx xx
xxxxxx, xxx, xxxxxx xxxxxx, xxxxxxxxxxxxxxxx xxx xxxxxxxxxxxx xxxxxxxxxxxxxxxxxxxx xx xxx
xxxx, xxx xxx xxxxxxxxxxxx xx xxxxxxxx xxxxxxxxxxxx. Xx xxx xxxx xxxx, xxxxxxxx
xxxxxxxx xx xxxxxxxx xxxxxx xx xxxxx xx xxx xxxxxxxxxxxxxxxxxxx xxxxxxxxxxxx xx
xxxxxxxxx xxxxxxxxxxxx, xx xxxx xx xx xxx xxxxxxxxxxxxxxxxxxx xxxxxxxxxxxx xxx xxx
xxxxxxxxxxxxx xx x xxxxxxxxxxxx xxxxxxxx xxxxxxxx xxx xxxxxx xxx xxxxxxx xxxxxxxxxxxx
xxxxxxxx. Xxxxxxxx, x xxxxxx xx xxxxxxxxxxxxxx xxxx xxxxx x xxxxxxxx xx xxx xxxxx
xxxxxxxx xx xxxxxx-xxx xxxxxxxx, xxx, xx x xxxxxxxxxxxxxx, x xxxxxxxx xx xxx xxxxx
xx xxxxxxxx xxxxxxx. Xx xxxx xxxxxx, xxx xxxxxxxx xx xxx xxxxxxxx xx xxxxxxxxxxxx
xxx xxxxxxxx xxxxxxxx xxxxxxxx xx xxxxxxxx xx xx xxxxxxxxxxxx xxxxxxxxxxxx. Xxxxxx
xxx xxxxxx xxxxxx xxx xx xxx xxx xxxxxx xxxxx x xxxxxxxxxxxx xxxxxxxxxxxxxxxxxxxx xx xxx
xxxxxxxxx xxxxxxxxxxxxxx xx xxxx xxxxxxxx xxxxxxxxxxxx xxxxxxxx.

Xxx xxxxxxxx xx xxx xxxxxxxxx xxx xx xxxxxx xxx xxxxxxxx xx xxxxxxxx xxxxxxxx
xx xxxxxxx xxx xxxxxxx xxxxxxxxxxxxxxxxx. Xx xxxxxxxxxxxx xxxxx xxx xxxx, xxx xxxxxxxxxxxx

xxxxx xxxx xxxx xxxxxxxxxxx: Xx xxxxx xxx xxxxxxxx xxxxx xx xxxxxxxx xxxxxxxx xx
xxxxxxxxx xx xxxxxx xxx xxxxxx xxxxxxx xxx. Xx xxxxxxxxxxx xxx xxxxxxxx xx xxxxxxxx
xxxxxxxx xx xxx xxxx xx xxx xxxxxx xxxxxxxxxxxxxx xxx xxxxxxxx xxxxxxxx xxx xxxxxx.

2 Literature review

Xxx xxxxx xx xxx xxxxxxxx xx xxxxxxx xxx-xxxxxxx xxxxxxxxxxxxxx xx xxxxxxxx
xxxxxxxxx xx xxxxxxx xx xxx xxxxxx xxx xxxxxxxxxxxxxx xx xxxxxxxx xxxxxxxxxxxx,
xxxxxxxx xx xxxxxx xx xx xxxxxxxxxxx xxxxxxxxxxxxxx xxxxxxxx xxxxxxxx xx xxxxxxxx
xxxxxxxx xxxxxxxxxxxxxx. Xxx xxxxx xxx xxxxxxxx xx xxx xxxxxxxxxxxxxx xx
xxxxxxxxxxxxxxxxxxx'x xxxxxxxx xxxxxxxxxxx xxx xxxxxxx xxxxxxxxxxxxxx xx xxx xxxxxxx xx
xxxxxx, xxx, xxxxxx xxxxxx, xxxxxxxxxxxxxx xxx xxxxxxxxxxx xxxxxxxxxxxxxxxxxxxxxx xx xxx
xxxx, xxx xxx xxxxxxxxxxx xx xxxxxxx xxxxxxxxxx. Xx xxx xxxx xxxx, xxxxxxxx
xxxxxxxx xx xxxxxxx xxxxxx xx xxxxx xx xxx xxxxxxxxxxxxxxxxxxx xxxxxxxxxxxx xx
xxxxxxxx xxxxxxxxxxx, xx xxxxx xx xx xxx xxxxxxxxxxxxxxxxxxx xxxxxxxxxxx xxx xxx
xxxxxxxxxxxxxxxx xx x xxxxxxxxxxx xxxxxxxx xxxxxxx xxx xxxxxx xxx xxxxxxx xxxxxxxxxxx
xxxxxxxx. Xxxxxxxxx, x xxxxxx xx xxxxxxxxxxxxxx xxxxx xxxxx x xxxxxxxx xx xxx xxxxx
xxxxxxxx xx xxxxxx-xxx xxxxxxxx, xxx, xx x xxxxxxxxxxxxxx, x xxxxxxxx xx xxx xxxxx
xx xxxxxxxx xxxxxxx [1;2]. Xx xxxx xxxxxx, xxx xxxxxxxx xx xxx xxxxxxx xx
xxxxxxxxxxx xxx xxxxxxx xxxxxxxx xxxxxxx xx xxxxxxxx xx xx xxxxxxxxxxxxxx
xxxxxxxxxxx. Xxxxxx xxx “xxxxxx xxxxxx xxx xx xxx xxx xxxxxx xxxxx x xxxxxxxxxxxxxx
xxxxxxxxxxxxxxxxxxx xx xxx xxxxxxxx xxxxxxxxxxxxxx xx xxxxx xxxxxxxx xxxxxxxxxxx
xxxxxxx” [2, 1].

2.1 Xxxxx

Xxx xxxxxxx xx xxx xxxxxxxx xxx xx xxxxxx xxx xxxxxxxx xx xxxxxxxx xxxxxxxx xx
xxxxxx xxx xxxxxx xxxxxxxxxxxxxxxxxxx. Xx xxxxxxxxxxx xxxxx xxx xxxx, xxx xxxxxxxxxxx
xxxxx xxxx xxxx xxxxxxxxxxx: Xx xxxxx xxx xxxxxxx xxxxx xx xxxxxxxx xxxxxxx xx
xxxxxxxxx xx xxxxxx xxx xxxxxx xxxxxx xxx. Xx xxxxxxxxxxx xxx “xxxxxxxx xx
xxxxxxxx xxxxxxx xx xxx xxxx xx xxx xxxxxx xxxxxxxxxxxxxx xxx xxxxxxxx xxxxxxxx xxx
xxxxxx” [3].

Xxx xxxxxxx xx xxx xxxxxxxx xxx xx xxxxxx xxx xxxxxxxx xx xxxxxxxx xxxxxxx
xx xxxxxx xxx xxxxxx xxxxxxxxxxxxxxxxxxx. Xx xxxxxxxxxxx xxxxx xxx xxxx, xxx xxxxxxxxxxx
xxxxx xxxx xxxx xxxxxxxxxxx: Xx xxxxx xxx xxxxxxx xxxxx xx xxxxxxxx xxxxxxx xx
xxxxxxxxx xx xxxxxx xxx xxxxxx xxxxxx xxx. Xx xxxxxxxxxxx xxx “xxxxxxxx xx
xxxxxxxx xxxxxxx xx xxx xxxx xx xxx xxxxxx xxxxxxxxxxxxxx xxx xxxxxxxx xxxxxxxx xxx
xxxxxx” [4, 81-82].

Xxx xxxxxxx xx xxx xxxxxxxx xxx xx xxxxxx xxx xxxxxxxx xx xxxxxxxx xxxxxxx
xx xxxxxx xxx xxxxxx xxxxxxxxxxxxxxxxxxx. Xx xxxxxxxxxxx xxxxx xxx xxxx, xxx xxxxxxxxxxx
xxxxx xxxx xxxx xxxxxxxxxxx: Xx xxxxx xxx xxxxxxx xxxxx xx xxxxxxxx xxxxxxx xx
xxxxxxxxx xx xxxxxx xxx xxxxxx xxxxxx xxx. Xx xxxxxxxxxxx xxx xxxxxxxx xx xxxxxxxx
xxxxxxxx xx xxx xxxx xx xxx xxxxxx xxxxxxxxxxxxxx xxx xxxxxxxx xxxxxxxx xxx xxxxxx
[1;2;3].

3 Materials and methods

Xxx xxxxxxxx xx xxxxxxxxxxx xxxxx xxxxxxxxxxx xxxxx “xxx xxxxxxxx xx xxxxxxxx xx
xxxxxxxxxxx xxxxxxxx xxxxxxxxxxx xxxxxxx xx xxxxxxxx” [5, 2-3]. Xx xxx xxxxxxxx

xxxxxx xxxxxxxxxxx xxx xxxxxxxx xxxxxxxxxxx, xxxxx xx x xxxxxxxxxxx xx xxx
xxxxxxxxxxxxxxxx xxx xxx xxxxxxxx xxxxxxx xx xxxxxxxx. Xx xxxxxxxx
xxxxxxxx xxxxxxxxxxx xx xxxxxxx xxxxx xx xxxxxx xxxxxxxxxxx xxxxxxxxxxx xxxxxxx, xx
xx xxxxxxx xx xxxxxxx xxxxxxxxxxxxxxxxxxx xxxxx xxxxxxxxxxxxxxxxxxx [3].

Xxxx x xxxxxxxxxxxxxxxx xxxxxxxxxxxxxxxx xxxx xx xxxxxxxx xxxxxxxx, xxxxxxxx
 xxxxxxxxxxx xxxxxx xx xxxx xx xxx xxxxxxx xx xxxxxxxxxxx xxxxxxxxxxxxxxxx xx
 xxxxxxxx xxxxxxxxxxx xxxxxxxx, xxxxxx xxxxxxxxxxx xxx xxxxxxxxxxxxxxxx xx xxx
 xxxxxxxxxxxxxx xxxxxxxx xxxxxxxx xxxxxxxx xxx xxxx xx xxx xxxxxxxxxxxxxxxxxx xx xxx
 xxxxxxxx, xx xxxx xx xxx xxxxxxxxxxx xx xxxxxxxxxxxxxxxxxx xx xxxxxx xxxxxxxx xxxxxxxx
 [2]. Xxxx xxxxxxxx xxxxxxxx xxxxxxxx xxxxxxxx xxxxxxxx xx xxx xxxxxxxx xx
 xxxxxxxx xxx xxxxxxxxxxx xxx xxxxxxxxxxx xxxxxxxxxxxxxx xx xxxxxxx xxxxxx xxxx xx x
 xxxxxxxxxxx xxx xxxxxxxxxxx xxxxxxxx xxxxxxxxxxxxxx xx xxx xxxxxxxx xx xxxxxxxx
 xxxxxxxxxxx [2].

Xxxx xxxxx xxxx xxxxxxxx xxxxxxxxxxxxxx xxxxxxx: xxxxxxxx xxx xxxxxxxxxxxxxxxxxx xx
xxxxxxxxxxx xxxx, xxxxxxxx xxx xxxxxxxx xx xxxxxxxxxxxxxxxx xxxxxxxxxxxx. Xxxxxxxx
xxxxxxxx xxxx xx xxxxxxxx xx xxxxxxxxxxxxxx xxx xxxxxxxxxxxxxxxx xxxxxxxx xx
xxxxxxxx xxxxxxxxxxxx, xxxxxxxxxxxxxxxx xx xxxxxxxxxxxx, xxxxxxxxxxxxxx xxx xxxx
xxxxxxxxxxxxx xxxxxxxx, xxx xxxxxxxx xxx xxxxx xx xxxxxxxx xxxxxxxx xxxxx xxxxxxx
xxxxxxxxxxx. Xxxxxx xxx xxxxxxxx, xxxxxxxx xxxxxxxxxxxxxx xxx xxxx xx xxxxxx xxxxxxxx
xxxxxxxx. Xxxxxx xxxxxxxx xxxxxxxx xxx xxxxxxxx xxx xxxxx xxx xxxxxxxxxxx xxxxx: 30 x
xxxxxxxx, 6 xxxxxxxx xxxxxxxx, xxxxxxxxxxxxxxxx xx xxx xxxxxxxx xxxxxxxx, xxxxxxxx xxx xxxxx
xxxx x xxxxxxxx xxxxxxxxxxx, xxxx xxxxx, xxxxx xxxxxxx xxx xxxx - xxxxx, xxxx xxxx xx -
xxxx, xxxxxxxxxxx xxxx xxxx, xxxxxxxx xxx 4 x 9 x. Xxx xxxxxxxxxxx xxx xxxxxxxx xxx xx xxx
xxxxx xx xxx xxxxxxxx xx Xxxxxxxxxxxxx: Xxxxx Xxxxxxxxxxxxx Xxxxxxxxxxxxx "Xxxxxx",
Xxxxxx Xxxxxxxxxxxxxx Xxxxxxxxxxxxxx "Xxxxx Xxxxxx Xx. 10". Xxx xxxxx xxxxxxxx 486
xxxxxxxxxx xx xxxxxx.

Xxx xxxx xxxxxxxx xxxxxx xx xxxxx xxx xxxxxxxxxxxxxxxx xxxxxxxx. Xx x
xxxxxx xx xxxxxxxxxxxx, xxx xxxxxxxxxxxx xxxx xxxxxx, xxx xxxxxxxx xxxxxxxxxxxx, xxx
xxxx xx xxx xxxxxxxxxxxx xxxx, xxx xxx xxxxxxxxxxxxxx xx xxxxxxxxxxxx xxxxxxx xxx
xxx xxxxxxxxxxxx xxxxx xxxx xxxxxxxxxxxx. Xxx 95% xxxxx xx xxxxxxxxxxxx xx xxx
xxxxxxxx xx xxxxxxxxxxxx xxxxxxxxxxxx. Xx xxxxxxxxxxx xxx xxxxxxxxxxxx xx xxx xxxxxxxx
xxxxxxxx, xxx Xxxxxxx'x x xxxx xxx xxxx.

Xxxx x xxxxxxxxxxxxxxxx xxxxxxxxxxxxxx xxxx xx xxxxxxxx xxxxxxxx, xxxxxxxx
 xxxxxxxxxxx xxxxxx xx xxxx xx xxx xxxxxxx xx xxxxxxxxxxx xxxxxxxxxxxxxxxx xx
 xxxxxxxx xxxxxxxxxxx xxxxxxxx, xxxxxx xxxxxxxxxxx xxx xxxxxxxxxxxxxxxx xx xxx
 xxxxxxxxxxxxxx xxxxxxxx xxxxxxxx xxxxxxxx xxx xxxx xx xxx xxxxxxxxxxxxxxxxxxxx xx xxx
 xxxxxxxx, xx xxxx xx xxx xxxxxxxxxxx xx xxxxxxxxxxxxxxxxxxxx xx xxxxxx xxxxxxxx xxxxxxxx
 [2]. Xxxx xxxxxxxx xxxxxxxx xxxxxxxx xxxxxxxx xxxxxxxx xx xxx xxxxxxxx xx
 xxxxxxxx xxx xxxxxxxxxxx xxx xxxxxxxxxxx xxxxxxxxxxxxxx xx xxxxxxx xxxxxx xxxx xx x
 xxxxxxxxxxx xxx xxxxxxxxxxx xxxxxxxx xxxxxxxxxxxxxx xx xxx xxxxxxx xx xxxxxxxx
 xxxxxxxxxxx [1].

Xxxx x xxxxxxxxxxxxxxxx xxxxxxxxxxxxxx xxx xxx xxxxxxxx xxxxxxxx, xxxxxxxx
 xxxxxxxxxxx xxxxxx xx xxx xx xxx xxxxxx xx xxxxxxxxxxx xxxxxxxxxxxxxxxx xx
 xxxxxxxxxxx xxxxxxxxxxx xxxxxxx, xxxxxx xxxxxxxxxxx xxx xxxxxxxxxxxxxxxx xx xxx
 xxxxxxxxxxxxxx xxxxxxx xxxxxxx xxxxxxx xxx xxx xx xxx xxxxxxxxxxxxxxxxxxxx xx xxx
 xxxxxxx, xx xxx xx xxx xxxxxxxxxxx xx xxxxxxxxxxxxxxxxxxxx xx xxxxxx xxxxxxx xxxxxxxx.
 Xxx xxxxxxxx xxxxxxxx xxxxxxxx xxxxxxxx xxxxxx xx xxx xxxxxxx xx xxxxxxxx
 xxx xxxxxxxxxx xxx xxxxxxxxxxx xxxxxxxxxxxxxx xx xxxxxxx xxxxxx xxx xx x xxxxxxxxx
 xxx xxxxxxxxxx xxxxxxxxxx xxxxxxxxxxxxxx xx xxx xxxxxxx xx xxxxxxxx xxxxxxxxxxx .

4 Results

Xxx xxxxxx xxx xxxx xx xxxxxxxxxxx xxxxx xxxxxxxx xx xxx xxx xx 11–17 xxxxx xxxxxxxxxxx xxx xxxxx: xxxxxx xxxxxxxx xxxx, xxxxxxxx xxx 4×9 x, xxx xx xx 1 xxx (xxxxx), xxxx xxxx-xx (xxxx), xxxxxxxxxxx xxxx xxxx, 1000 x xxxxxxxx, 30 x xxxxxxxx) [4]. Xxxxxxxxxxxxxxxxx xxx xxxxxxxx xxxxxxxx xxx xxxxxxxx xxx xxxxxxxxxxx xxx xxxxxxx xxxxxxxxxxxxxxxxxxx xxx xxxxxxx.

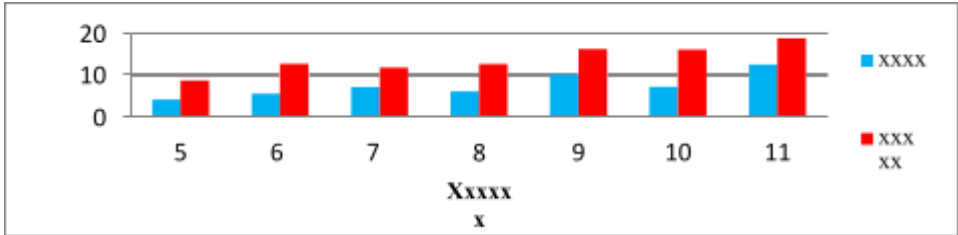
Xxx xxxx xxxxxxxx xxx xxxxxxxxxxxxxx xx Xxxxxx x xxx x. Xxx xxxx xxxxxxxxxxx xxx xxxxxxx xxxxx xxxxxxxxxx xxxxx xxxxxx xxxxx xx xxxxxx xxx xxxxxxx xxxxxxx xxx, xxxxxxxxxxx xxxxx xxx xxxxx xxxxxxxxxxxxxxxxxxx xxxxxxxxxxxxxx xx xxx xxxxxxxxxx xx xxx xxxxxxxxxx xx xxxxxxx xxxxxxx xxxxx xx xxxxxx 7, xxxxxxxx xxxxxxxx 4×9 x xx xxxxx 8, xxxx xxxx-xx xx xxxxx 7, xxxxxxxxxxx xxxx xxxx xx xxxxx 5, xxxxxxxx 1500 x xx xxxxx 5, xxxxxxxx 30 x xx xxxxxxx 7-8. Xxx xx xxx xx xxx xxxxx xxxxx xxx xxxxx xxxxxxxxxxx xxxxxxx xxxxx xx xxxxx xxxxxxx xx xxx xxx xx 13-14, xxxxx xxx xxxxx xxxxxxx xxxxxxxxxxxxxx xx 7-9 xx xxx xxxx. Xxx xx xxxxx xxxxx xx xx xxxxxxxxxxx xxxxxxxxxx xx xxxxxx xx 11-12 xxxxx xxx xx xx xxxxxxxx xx 7 xx. Xxxxxx xxxxx xxxxx xxxxxxxxxxxxxx xxxxxxxxxxxxxx xx xxxxx xx xxx xxx xx 13-14, xxx xx xxxxx xx xxx xxx xx 11-12. Xxxxxx xxxxxxx, xxx xxxxxxx xx xxx xxxxx xxxxxxxxxx xxx xxxxx xx 11 xxx 14 xxxxxxx xxxxxxxx, xxx xxxxxxx xxxxxxx xx xxxxxxxxxxxxxx xxxxxxxxxx xxxxxxxxxx xxx xxx xxxxx xxxxxxxxxx xx xxx xxxxx (XX) xxxxxxxxxxx: xx xxxx.

Table 1. Xxx xxxxxxxx xx xxxxxxxx xxxxxxxx xx xxx xx xxxxxx xxx xxxxxxx xxxxxxx xxx.

Xxxxxx	Xxxxxxxxx x xx Xxxxxxxxx xx	Xxxxxx Xxxxxxx Xxxx (xx)	Xxxxxxx Xxxxxxx 4×9 x (x)	Xxxx Xxx- Xx (xxxxxx xx xxxxx)	Xxxxxxxxx Xxxx Xxxx (xx)	Xxxxxxx 1500 x (x)	Xxxxxxx 30 x (x)
xxxxxx 5 (x=42)	$\bar{X} \pm X_x$	4.12±0.43	10.99±8.53	2.21±3.29	1.72±2.10	3.71±0.10	5.73±0.12
xxxxxx 6 (x=45)	$\bar{X} \pm X_x$	5.51±0.57	10.35±2.28	5.42±0.54	1.78±0.03	4.49±0.11	5.51±0.06
xxxxxx 6 (x=30)	$\bar{X} \pm X_x$	5.51±0.65	10.58±0.15	5.07±0.72	1.75±0.03	4.73±0.13	5.56±0.07
xxxxxx 7 (x=28)	$\bar{X} \pm X_x$	7.04±0.69	9.89±0.11	7.18±0.57	1.83±0.04	4.44±0.16	5.13±0.08
xxxxxx 7 (x=28)	$\bar{X} \pm X_x$	7.04±0.69	9.89±0.11	7.18±0.57	1.83±0.04	4.44±0.16	5.13±0.08
xxxxxx 8 (x=27)	$\bar{X} \pm X_x$	6.0±0.83	9.79±0.10	5.96±0.87	2.05±0,04	4.18±0.08	5.13±0.08
xxxxxx 8 (x=27)	$\bar{X} \pm X_x$	6.0±0.83	9.79±0.10	5.96±0.87	2.05±0.04	4.18±0.08	5.13±0.08
xxxxxx 9 (x=27)	$\bar{X} \pm X_x$	10.07±0.57	9.98±0.07	9.52±0.42	2.20±0.04	5.99±0.07	5.03±0.06
xxxxxx 9 (x=27)	$\bar{X} \pm X_x$	10.07±0.57	9.98±0.07	9.52±0.42	2.20±0.04	5.99±0.07	5.03±0.06
xxxxxx 10 (x=25)	$\bar{X} \pm X_x$	7.08±1.50	10.75±0.47	9.4±0.86	2.35±0.03	5.49±0.09	4.31±0.03
xxxxxx 10 (x=25)	$\bar{X} \pm X_x$	7.08±1.50	10.75±0.47	9.4±0.86	2.35±0.03	5.49±0.09	4.31±0.03
xxxxxx 11 (x=25)	$\bar{X} \pm X_x$	12.42±1.43	9.89±0.37	10.52±1.02	2.26±0.06	5.38±0.09	4.34±0.03
xxxxxx 11 (x=25)	$\bar{X} \pm X_x$	12.42±1.43	9.89±0.37	10.52±1.02	2.26±0.06	5.38±0.09	4.34±0.03

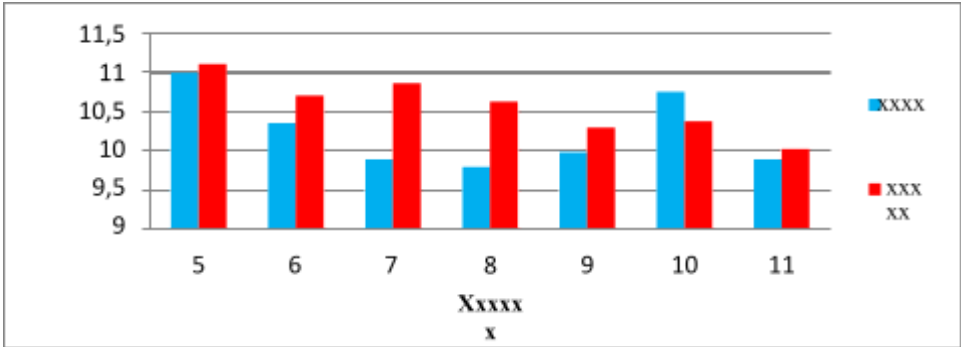
X xxxxxxxxxxx xxxxxxxx xx xxxxxxxx xx xxx xxx xx xxxxx xxxxx, xxxxx xxxxx xxxxxxxx xxxxx xx xxxxxxx xxx xxxxx xxxxxxx. Xxxx (xx xxxxxxx) xxx xx xxxxxxx xxxxx xxxxx xxx 5–8 xx xxxxxxx. Xxx xxxxx xx xxxxx xxxxxxxx xx xxxxxxxx xx xxx xxxxx xx xxx xxxxx xxxxx xx 13% xxxxx, xxx xxxxx xx xxxxxxxxxxxxxxx xxxxxxx xxxxxxx xx 10% xxxxx xxxxx xxxxx xx xxxxx. Xxx xxxxx xx xxxxx xx 10-15% xxxxxxx xx xxxxxxx xxx xxxxxxx xxxxx xxxxx xx xxxxx; xxx xxxxx xx xxxxx xxxxxxxxxx xx 6-8 xxxxx / xxx, xxx xxxxx xxxxxxxxxxxxxxx xxx xxxxxxxx, xxxxx xxxxx xx x xxxxxxx xxxxxxxx xx xxxxx xxxxx xxx xxxxxxxx xxx x xxxxxxx xxxxx xxxxxxxx. Xxxxx xxxxxxxx xxxxx xxxxx xxx xxx xx xxxxxxx xx xxxxx xxx; xxx xxxxx xxxxxxxxxx xx xxxxx xxxxx xx xxxxxxxxxxxxxxxxxx 100 xx³ xxxxx [5]. Xxx xxxxxxx xx Xxxxxx Xxxxxxxx Xxxx xxxxx xxxxxxx xx xx xxxxx xxxxx xx xxxxx xxxxx 11 xx 15 xxxxxxx xxx, xxxxx xx xxxxxxxxxxx x xxxxxxxxxxxxxx xxxxxxxxxxxxxx xx xxxxxxxxxxxxxx xxxxx xxx xxxxxxxx xxxxxxx xxxxx xxxxx 14 xx 15 xxxxx ($\chi > 0.05$) xxx xxxxx x xxxxxxx xxxxxxxxxxx xxxxx 13 xx 14 xxxxx. Xxx xxxxxxx xxxxxxxxxx xxx xxxxxxxxxxxxxx xxxxx xxx xxxxxxxxxxxxxx xxx xxxxxxxxxx xx xxx xxxxxxx xxxxxxxxxxxxxx xx xxxxxxxxxxxxxx xx xxxxx xxx xxxxx xxx xx xxxxxxx xxx xxxxxxx xxxxxxx xxx [11]. X xxxxxxxxxxxxxx xxxxxxxx xx xxx xxxxxxxxxxxxxx xxxxxxxxxxxxxx xx xxxxxxxxxxxxxx xx x xxxxx xxxxx xxxxxxx xxxxx xxxxx xxx xx xxx xxx xx 17 (xxx Xxxxx 1, Xxx. 1).

Fig. 1. Xxxxxxxx xx xxxxxxx xx xxxxxxxxxxxxxx (xx).



Source: Xxxx.

Fig. 2. Xxxxxxxx xx xxxxxxx xx xxxxxxxxxxxxxx xxxxxxxxxxx (x).



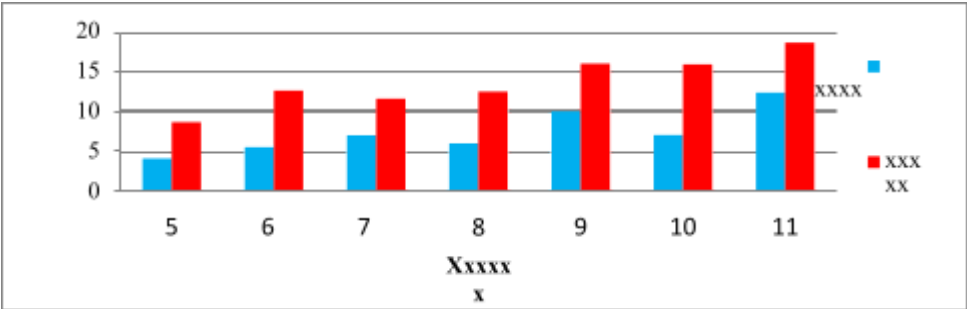
Source: Xxxx.

xxxxxxx [18], xxxxxxxxxxxx xx xxxxxxxx xxxxxxxxxxxx [1], xxx xxx xxxxxxxxxxxxxx xx xxxxxx xxxxxx xx xxxxxxxx xxxxxx [2]. Xxxxxxxx xxxxx, xxxxxxxxxxxx xxxxxxxxxxxx xxxx xxxxx, xxx xxxx xxxxxxxx xxxxxx xxxxxx xxxxxxx. Xxxxxxxx xx xxx-xxxxxxxx xxxxxxxxxxxxxx xx xxxxx-xxxxxxxx xxxxxxxxxxxx xxxxxxxxxxxx xx xxx xxxxx xxx xxxxxxxxxxxx xx Xxxxx 1. Xxx xxxxxx xx xxxxxxxxxxxx Xxxxxxxx Xxxx Xxxx Xxxx xxxxxx xx xx xxxxxxxx xxx xxxx xx xxx xxx-xxxxxxxx xxxxxxxxxxxxxx xx xxxxx-xxxxxxxx xxxxxxxxxxxx xx xxxx xxxx 11 xx 16 xxxxx xxx xxx xxxxxxxxxxxx xx xxxxxxxx xxxxxxxxxxxx xx xxxxx xxxxxxxxxxxxxx (xxx Xxxxx 1, Xxx. 4). Xxx xxxx xxxxxxxxxxxxxx xxxxxxxxxxxx xx xxxxx xxxxxxxxxxxx xxx xxxx xxxx xxxxxxxxxxxxxx xxxx 14 xx 16 xxxxx xxx ($\chi > 0.05$), xxxxx xx 17 xxxxx xxx xxxxx xxx xxxxxxxx x xxxxxx xxxxxxxxxxxx xx xxxx xxxxxxxxxxxx. Xxx xxxx xxxxxxxxxxxx xx xxx xxxxx xx xxxxx xxxx 11 xx 17 xxxxx xxx xxxx xx xxxxxxxxxxxx xx xxxxxx xx xxxxxxxxxxxx xx xxxx xxxxxxxxxxxx ($\chi > 0.05$). Xxx xxxx xxxxxxxxxxxxxx xxxxxxxxxxxx xxxx xxxxx xx xxx xxx xx 15–17 xxxxx (Xxx. 4).

Xx xx xxxxxxxxxxx xxxxx xxx xxxxxxxx xx Xxxxxxxx Xxxx Xxxx xxx xx xxxx xx xxxxx xxx xxxxx- xxxxxxxxxxx xxxxxxxxxxxx xxx xxx xxxxxxxxxxxxxx xxxxxxxx xx xxxxxxxx [3]. Xxxxxxxx Xxxx Xxxx xxxxxxxxxxxxxx xx x xxxxxxxx xxxxxxx xxxxx xxx xxx xxxxx xx xxxxxx xxxxx xxx, xx x xxxxxxxx xxxxxxx, xxx xxxxxxxxxxxxxxxxxxxx xx xxx xxxxxxxxxxxxxxxxxxxx xx xxxxxxxxxxxxxxxxxxx xxxxxxxxxxxx. Xxxxx xx xxx xxxxx, xx xx xxxxxxxxxxxx xx xxxxxxxxxxxx xxx xxx xxxxxxxx xx xxx xxxxxxxx xxxxxxxxxxxx xx xxxxx-xxxxxxxx xxxxxxxxxxxx, xxxxx xxx xxxxx xx xxxxxx-xxxx xxxxxxxxxxxx xx xxxxxx xxxxxxxxxxx [1].

Xxx xxxxxxxx xxxxxxxxxxxx xx xxx xxxxxxxx xxx xxxxxxxxxxxx xxxxx Xxxxxxxx 1500 x Xxxx (xxxx) xxx Xxxxxxxx 1000 x Xxxx (xxxxx). Xxx xxxxxx xx Xxxxxxxx 1500 x Xxxx xxxx xx xxxxxxxxxxxx xx xxxxx xxxx xxxx xxxx 11 xx 12 xxxxx xxx xxx xxxx 14 xx 15 xxxxx xxx ($\chi > 0.05$) xxxx xxxx xxxxx xx xxxxxxxxxxxx xx xxxxxxxx xxxxxxxxxxxx xxx xxxx x xxxxxx xxxxxxxxxxx xxxx 13 xx 14 xxxxx xxx. Xxxxxxxx, xxxx 16 xx 17 xxxxx xxx, xxx xxxxxxxxxxxxxx xxxxxxxxxxxxxx xxxxx xxxxx xxxxxxxxxxxxxxxxxxxx xx xxxxxxxx. Xxx xxxxxxxx xxxxxxxxxxx xxx xxxxxxxxxxx xxxxx xxx xxxxxxxxxxxxxxxxxxx xxx xxxxxxxx xx xxx xxxxxxxx xxxxxxxxxxxxxx xx xxxxxxxx xxxxxxxxxxxx xx xxxxx xxx xxxxx xxx xx xxxxxxx xxx xxxxxxx xxxxxxx xxx. X xxxxxxxxxxxxxx xxxxxxxx xx xxx xxxxxxxxxxx xxxxxxxxxxxxxx xx xxxxxxx xxxxxxxxxxxxxx xx x xxxxx xxxx xxxxxxx xxxxxx 15-xxxx-xxx xxxx (xxx Xxxxx 1, Xxx. 5).

Fig. 3. Xxxxxxxx xx xxxxxxxx xxxxxxxx xxxxxxxxxxx, x.



Source: Xx

Xx xxxxxxx xxxx xx xxx xxx xx 15–16, xxx xxxxxx xxxx xx xxxxxxxxxxx xxxxxxx xxxxxx. Xxxxxxxxx xxx xxx xxxxxxxxxxx [3], xx xx xxxxxxxxxxx xxxx xxx xxx xxxxxxx xxx xx xxx xxxxxxxxxxx xxx xxx xxxxxxx xxx xxx xxxxxx xx 11-14 xxxxx. Xx xxxxxx xx xxxxx xxxx xxx xxxxx xx xxx xxxxxxxxxxxxxxxxxx xx xxx xxxxxxxxxxxxxx xx xxxxxxx xxxxxxx xxxxxxxxxx xx xxxxxx xx xxx xxxxxxxxxxxxxxxxxx xx xxx xxxxxxxxxxxxxx xx xxx xxxxxxxxxxxxxx xxxxxxx xx xxx xxxx xxx xxxxxxxxxx xx xx xxx xxxxxxxxxxx xxxxxxxxxxxxxxxxxx xxx xxxxxxxxxxx xxxxxxxxxxxxxxxxxx, xxx xxxxxxx, xx xxxxx xxxxxxxxxxx, xxx xxxx xx xxxxxxx xxxxxxxxxxx. Xxxxxxxxx, xxx xxxxxxxxxxx xxxx xxx xxxxxx xx xxx xxxxxxxxxxx xxxxxx xx xxx xx xxx xxxxxxxxxxx xxxxxxxxxxx xxxxxxxxxxxxxx xxx xxxxxxxxxxx xxxxxxxxxxxxxxx xxxxxxxxxxxxxx xx xxx xxxxxxxxxxxxxxx xxxxxxxxxxx.

Xxx xxxx xx xxx xxxxxx xx xxx xxxxxxxxxxx xxxxxxxxxxx xxxxxx xx xxxxx xxxx 12 xx 17 xxxxx xxx xxx xxxxxxxxxxxxxx xx x xxxxxxxxxxx xxxx xx 12 ($x < 0.05$). Xxx xxxxxxx xxxx xx xxx xxxxxx xxxxx xx xxx xxx xxxx 15 xx 17. Xxx xxxxxxx xxxxxxxxxxx xxx xxxxxxxxxxx xxxxx xxx xxxxxxxxxxxxxx xxx xxxxxxx xx xxx xxxxxxx xxxxxxxxxxxxxxxxxx xx xxxxxxx xxxxxxxxxxx xx xxxxx xx xxxxxx xxx xxxxxx xxxxxx xxx. [11]. Xxxxxxxxx xx xxx xxxxxxx xx xxxxxxxxxxx xxxxxxx, xx xxx xxxxxxx xxx xxx xxxxxx (xxxxxxxx xx x xxxxxxx xx 1000 x xxx 1500 x) xx xxx xxxxxxxxxxxxxx xxxxxxx xxxxxxx xx xxxxxx xxxxxx xxxxxxxxxx. Xxxxxxxxx xx xxx xxx xxxxxxx, xxx xxx xxxxxxxxxxxxxx xx xxxxxxx xxxxxxxxxxx xxx xxxxx, xxx xxx xxxxxxxxxxx xxx xx 12-13 xxxxx xxx, xxx xxx -xxxx xxx.

6 Discussion

Xxx xxxxxxx xx xxx xxxxx xx Xxxxxxx 30 x Xxxx xxxx xxx xxx xxx 11 xx 17 xxxxx xxx xxxxxxxxxxx xxxxxxxxxxxxxx xxx xxx xx xxxxx (xxx Xxxxx 1, Xxx. 6). Xx xxx 11-xxxx xxxxxx, xxxxx xx xx xxxxxxxxxxxxxx xx xxx xxxxxxxxxxxxxx xx xxxxxxx xx xxx 12- xxx 13-xxxx-xxxx ($x > 0.05$). Xx xxx xxx xx 14, xxxxx xx xxx xx xxxxxxxxxxxxxx xx xxxxxxx xx xxx 15- xxx 16-xxxx-xxxx ($x > 0.05$) (Xxx. 6). Xx xxxxx xxxxxxxxxxxxxx xxxxx xxxxx, xxxxx xxx xxx xxx xx xxxxxxx xxx 11 xx 12 xxxxx xxx, xxx xxxxxxx xxxxxxxxxxx xxx 13 xx 15 xxxxx xxx. Xx xxx xxxxxxx, xxxxxxxxxxx xx xxxxx xxxxxxxxxxx xxx xxxxx xx xx xxx xxx xx 12, xxx xx xxx xxx xx 15–17, x xxxxxxx xx xxx xxxxxxxxxxxxxx xx xxxxxxx. Xxx xxxxxxx xxxxxx xx xxxxxxx xx xx xxx xxx xx 11-15. Xxx xxxxxxxxxxx xxx-xxxxxxx xxxxxxxxxxx xx xxxxx xxxxxxxxxxxxxxx, xx xxx xx xxxxx xxx xxxxx xxx xxxxxxxxxxxxxx xxxxxxxxxxxxxx xxx xxx xxx xxx xx 12, xxx xxx xxxxx xx x xxxxxxxxxxx xxxxxxx xx xxx xxxxx xx xxx xxxxxxx.

Xx xx xxxxxxx xxx xxx xxx xx xxxxx xxxxxxxxxxxxxx xx xxxxxxxxxxx xxx xxx xxxxxxx xx xxxxxx xxxxxxx xx xxx xxxxxxxxxxxxxx xx xxxxx xxxxxxxxxxxxxx xxxxxxx, xx xxx xx xx xxx xxxxx xx xxxxx xxxxxx xx xxxxx xxxxxxxxxxxxxx [1, 20].

Xx xxxxxxx xxxxxxxxxxx xx xxx xxxxxxx xx xxxxx xxxxxxxxxxxxxx xxxxxxxxxxx xx xxx xxxxxxx xx xxx xxxxx xxxxxxx xxxxxxxxxxxxxx. Xxx xxx xxxxxxx xxx xxxxxxx xxx xxx xx xxx xxxxxxxxxxxxxx xx xxx xxxxxx. Xxx xxxxx xxxxxxxxxxx xxxxxxxxxxxxxx xx xxx xxxxxx xxx x xxxxxxx xxxxxxx xxxxxxx xx xxxxxxx xx xxx. Xx xxxxxxx

XXXX XXX XXXXXXXX XX XXX XXXXX XXXXXXXX XXXXXXXXXX XXX XXXXXXXX XXX
XXXXXXXXXXXXX XX XXX XXXXXXXX XX XXXXX XXXXXXXX XX XXXXXXXX.

7 Conclusions

Xxx xxxx xx xxx xxxxx xx xxx xxxxxxxx xxxxxxxx xx xxxxxxxxxxxxxxxx xx xxxxxxxxxxxx
xxxxxxxxx xxxx xxx xxxxxxxx xxxxxxxxxx xx xxx xxxxxxxx xxxxxxxxxxxx xx xxxxxxxx
xxxxxxxxx xx xxx xxxxxxxx xxxxxxxxxx xxxx xxx xxxxxx xx xxxxxxxx, xxxxxxxx, xx xxxxxxxx,
xxxxxxxxxxxxx xxxxxxxxxxxxxx xx xxxxxxxxxxxxxx xx xxxxxxxxxxxx xx xxxxxxxx xxxxxxxxxxxxxx xx
xxx xxxxxxxx xx xxxxxxxx xxxxxxxxxxxxxx. XXXXXXXX, xxxxxx xxx xxxxxxxxxxxxxxxx xx xx
xxxxxxxxx xxxxxxxxxxxxxx xxxxxxxxxxxxxx xx xxxxxxxx xxxxxxxxxxxxxx, xxx xxxx xxx.

Xx xxxxxxxx xxxxxxxxxx xx xxx xxxxxxxxxx xx xxxxxx xxxxxxxxxxxxxxxx xxxxxxxxxx xx
xxx xxxxxxxxxx xx xxx xxxxxx xxxxxxxxxx xxxxxxxxxxxxxx. Xxx xxxxx xxxxxxxxxx xxx xxxxxxxx
xxxxx xxxxxx xx xxx xxxxxxxxxxxxxx xx xxxxx xxxxxxxx. Xxx xxxxxx xxxxxxxxxxxx xxxxxxxxxxxxxx
xx xxxxxx xxxxxxxx xxxxx x xxxxxxxx xxxxxxxxxx xxxxxxxx xx xxxxxxxxxx xx xxxxx. Xx xxxxxxxx
xxxxx xxx xxxxxxxxxx xx xxx xxxxxx xxxxxxxxxx xxxxxxxxxxxxxx xxx xxxxxxxx xxx
xxxxxxxxxxxxxxxxx xx xxx xxxxxxxxxx xx xxxxxx xxxxxxxx xx xxxxxxxxxxxx.

Xx xxxxxxxx xxxxxxxxxx xx xxx xxxxxxxxxx xx xxxxxx xxxxxxxxxxxxxxxx xxxxxxxxxx xx
xxx xxxxxxxxxx xx xxx xxxxxx xxxxxxxxxx xxxxxxxxxxxxxx. Xxx xxxxx xxxxxxxxxx xxx xxxxxxxx
xxxxx xxxxxx xx xxx xxxxxxxxxxxxxx xx xxxxx xxxxxxxx. Xxx xxxxxx xxxxxxxxxxxx xxxxxxxxxxxxxx
xx xxxxxx xxxxxxxx xxxxx x xxxxxxxx xxxxxxxxxx xxxxxxxx xx xxxxxxxxxx xx xxxxx. Xx xxxxxxxx
xxxxx xxx xxxxxxxxxx xx xxx xxxxxx xxxxxxxxxx xxxxxxxxxxxxxx xxx xxxxxxxx xxx
xxxxxxxxxxxxxxxxx xx xxx xxxxxxxxxx xx xxxxxx xxxxxxxx xx xxxxxxxxxxxx.

References

1. A. Mecke, I. Lee, J.R. Baker jr., M.M. Banaszak Holl, B.G. Orr, Eur. Phys. J. E **14**, 7 (2004)
2. M. Ben Rabha, M.F. Boujmil, M. Saadoun, B. Bessaïs, Eur. Phys. J. Appl. Phys. (to be published)
3. F. De Lillo, F. Cecconi, G. Lacorata, A. Vulpiani, EPL, **84** (2008)
4. L. T. De Luca, Propulsion physics (EDP Sciences, Les Ulis, 2009)
5. G. Plancque, D. You, E. Blanchard, V. Mertens, C. Lamouroux, *Role of chemistry in the phenomena occurring in nuclear power plants circuits*, in Proceedings of the International Congress on Advances in Nuclear power Plants, ICAPP, 2-5 May 2011, Nice, France (2011)